

SIEMENS

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Siemens SINAMICS G120c Compact converter



Siemens Sinamics g120c is a series of very compact basic frequency converters with wide functionality for working in industrial cabinets.

The main advantages of Sinamics 120C series are:

- Extremely compact size;
- Easy integration;
- Leading edge technology;
- Effective communication.

Siemens Sinamics g120c is a vfd converter that combines high power density in a very compact body. Due to this, the device can perform the tasks of standard size inverters, while occupying a minimum of working space.

To find out stock ability and delivery time to your region, please contact our manager.



info@eltra-trade.com

SINAMICS G120C compact inverters 0.55 kW to 132 kW (0.75 hp to 150 hp)



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SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Introduction

Application

| Use | Requirements for torque accuracy/speed accuracy/position accuracy/coordination of axes/functionality | | | | | |
|------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| | Continuous motion | | | Non-continuous motion | | |
| | Basic | Medium | High | Basic | Medium | High |
| | | | | | | |
| Pumping, ventilating, compressing | Centrifugal pumps Radial / axial fans Compressors | Centrifugal pumps Radial / axial fans Compressors | Eccentric screw pumps | Hydraulic pumps Metering pumps | Hydraulic pumps Metering pumps | Descaling pumps Hydraulic pumps |
| | V20 G120C G120P | G120P G130/G150 G180 ¹⁾ | S120 | G120 | S110 | S120 |
| Moving | Conveyor belts Roller conveyors Chain conveyors | Conveyor belts Roller conveyors Chain conveyors Lifting/lowering devices Elevators Escalators/moving walkways Indoor cranes Marine drives Cable railways | Elevators Container cranes Mining hoists Excavators for open-cast mining Test bays | Acceleration conveyors Storage and retrieval machines | Acceleration conveyors Storage and retrieval machines Cross cutters Reel changers | Storage and retrieval machines Robotics Pick & place Rotary indexing tables Cross cutters Roll feeds Engagers/disengagers |
| | V20 G110D G110M G120C ET 200pro FC-2 ²⁾ | G120 G120D G130/G150 G180 ¹⁾ | S120 S150 DCM | V90 G120 G120D | S110 S210 DCM | S120 S210 DCM |
| Processing | Mills Mixers Kneaders Crushers Agitators Centrifuges | Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces | Extruders Winders/unwinders Lead/follower drives Calenders Main press drives Printing machines | Tubular bagging machines Single-axis motion control such as • Position profiles • Path profiles | Tubular bagging machines Single-axis motion control such as • Position profiles • Path profiles | Servo presses Rolling mill drives Multi-axis motion control such as • Multi-axis positioning • Cams • Interpolations |
| | V20 G120C | G120 G130/G150 G180 ¹⁾ | S120 S150 DCM | V90 G120 | S110 S210 | S120 S210 DCM |
| Machining | Main drives for • Turning • Milling • Drilling | Main drives for • Drilling • Sawing | Main drives for • Turning • Milling • Drilling • Gear cutting • Grinding | Axis drives for • Turning • Milling • Drilling | Axis drives for • Drilling • Sawing | Axis drives for • Turning • Milling • Drilling • Lasering • Gear cutting • Grinding • Nibbling and punching |
| | S110 | S110 S120 | S120 | S110 | S110 S120 | S120 |

SINAMICS G120C compact inverters continuously control the speed of three-phase asynchronous (induction) motors and can be used in a wide range of industrial areas. They are generally suitable for applications involving conveyor belts, mixers, extruders, pumps, fans, compressors and basic handling machines.

Practical application examples and descriptions are available on the Internet at www.siemens.com/sinamics-applications

More information

You may also be interested in these drives:

- More performance for the control cabinet in IP20 degree of protection ⇒ SINAMICS G120
- Higher degree of protection for power ratings up to 7.5 kW ⇒ SINAMICS G110M, SINAMICS G110D, SINAMICS G120D (Catalog D 31.2)
- With positioning function in the control cabinet in IP20 degree of protection ⇒ SINAMICS G120, SINAMICS S110
- With positioning function for distributed drive solutions in IP65 degree of protection ⇒ SINAMICS G120D (Catalog D 31.2)

¹⁾ Industry-specific inverters.

²⁾ Information on the SIMATIC ET 200pro FC-2 frequency converter is available in Catalog D 31.2 and at www.siemens.com/et200pro-fc

Overview



SINAMICS G120C, frame sizes FSAA to FSF, with Intelligent Operator Panel IOP-2

SINAMICS G120C compact inverters offer a well-balanced combination of features to address a wide range of applications. They are compact, rugged devices that are easy to operate and can be optionally equipped with a basic or advanced operator panel.

SINAMICS G120C inverters are especially suitable when it comes to meeting the requirements of system integrators, OEMs and distributors regarding high productivity and tailored performance.

Benefits

- Compact design
- Frame size FSAA allows easy DIN rail mounting
- Side-by-side design
- High power density, low envelope dimensions
- Simple installation in the tightest space
- Low space requirement
- Use in small control cabinets, close to the machine
- Optimized parameter set
- Optimized commissioning
- Compact Operating Instructions
- BOP-2 or IOP-2 operator panels can be used
- Integrated USB connection
- Simple and fast software parameter assignment
- Simple to use during commissioning and in operation
- Minimized training costs, existing SINAMICS know-how can be used
- High degree of service friendliness, simple maintenance
- Plug-in terminals
- Cloning function using BOP-2, IOP-2, or memory card
- Operating hours counter for "drive on" and "motor on"
- Fast mechanical installation
- Intuitive standard commissioning
- Component of Totally Integrated Automation
- Energy-efficient, sensorless vector control
- Automatic flux reduction with V/f ECO
- Integrated energy saving computer
- Safety Integrated (STO)
- Communication versions with PROFINET / EtherNet/IP, PROFIBUS DP, USS/Modbus RTU
- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to the optional SINAMICS G120 Smart Access
- Coated modules
- Operation up to an ambient temperature of 60 °C

Design

SINAMICS G120C is a compact inverter for control cabinet mounting in IP20 degree of protection where the Control Unit (CU) and Power Module (PM) function units are combined in one device.

The compact mechanical design and the high power density allow these devices to be installed in machine control enclosures and control cabinets for maximum space utilization. The SINAMICS G120C compact inverter can be butt-mounted directly, without derating at temperatures up to 40 °C (104 °F).



SINAMICS G120C, frame size FSAA with BOP-2

SINAMICS G120C can be integrated into the widest range of applications, either using the integrated digital and analog inputs or via the integrated fieldbus interface (available in USS, Modbus RTU, PROFIBUS, PROFINET, EtherNet/IP versions). Especially the product versions with integrated PROFIBUS/PROFINET interface make full integration into the Siemens TIA family possible, therefore allowing the advantages of the seamless TIA product family to be fully utilized. SINAMICS G120C devices are preset in the factory so that they can be immediately connected to PROFIBUS or PROFINET fieldbus systems without parameterization.

Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to the optional web server module SINAMICS G120 Smart Access enabling user-friendly operation and easy access to the inverter, even if this is installed in areas difficult to access.

SINAMICS G120C is also equipped with the safety function STO (Safe Torque Off) as standard, which is used to safely stop drives. As a consequence, machine manufacturers can simply comply with current machinery directives with minimum associated costs.

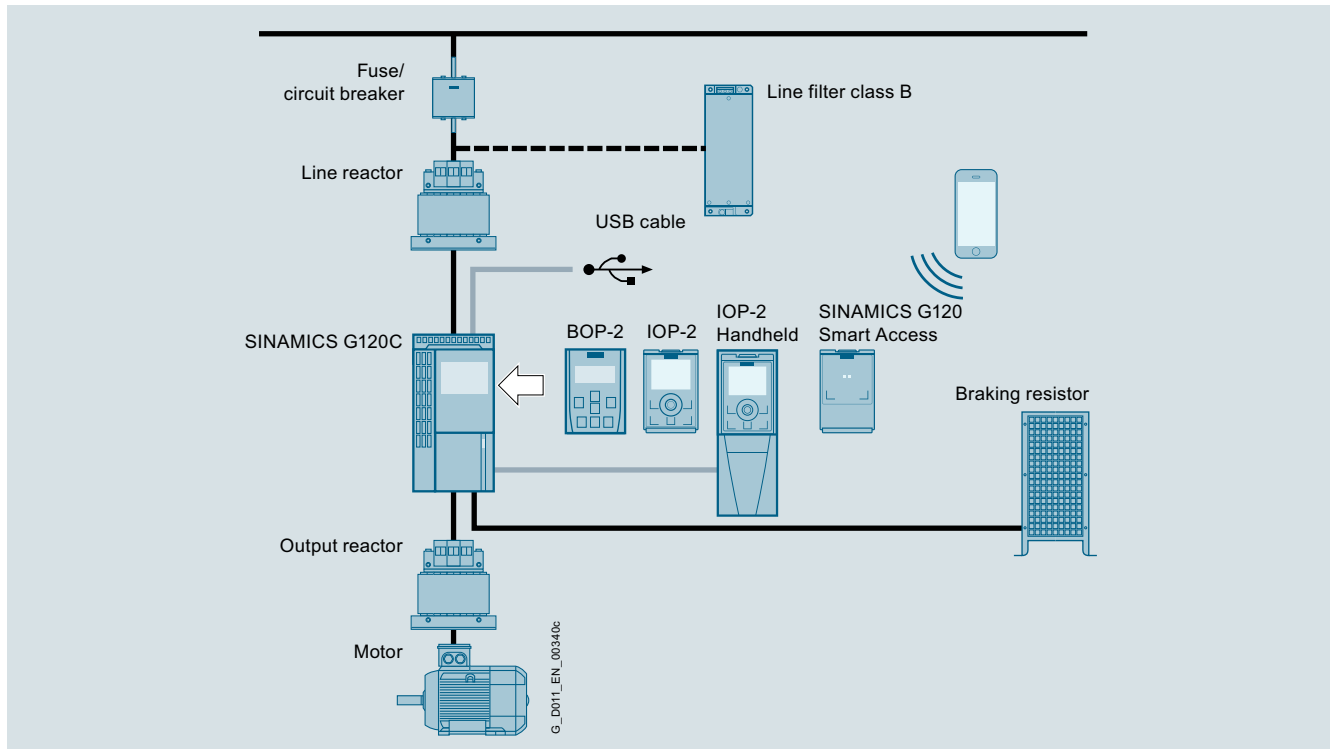
SINAMICS G120C can control asynchronous (induction) motors in the power range from 0.37 kW up to 132 kW (0.5 hp to 200 hp). Reliable and efficient motor operation is achieved by using state-of-the-art IGBT technology combined with vector control. The extensive range of functions integrated in the SINAMICS G120C also offers a high degree of protection for the inverter and motor.

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Design (continued)



Line-side components

Line filters

SINAMICS G120C can be ordered with or without integrated Class A line filters. Optionally, an external Class B line filter can be used for classifying in a higher interference class.

Line reactors

Line reactors smooth the current drawn by the inverter and thus reduce harmonic components in the line current. Through the reduction of the current harmonics, the thermal load on the power components in the rectifier and in the DC link capacitors is reduced as well as the harmonic effects on the supply. The use of a line reactor increases the service life of the inverter. A DC link reactor is integrated in frame sizes FSD to FSF, and therefore no line reactor is required.

Recommended line-side overcurrent protection devices

Overcurrent protection devices are absolutely necessary for the operation of the inverters. The table listed in the section "Recommended line-side overcurrent protection devices" provides recommendations according to IEC and UL regulations, depending on the area of application. Recommendations on further overcurrent protection devices are available at: <https://support.industry.siemens.com/cs/document/109750343>

More information about the listed Siemens fuses is available in Catalog LV 10 as well as in the Industry Mall.

DC link components

Braking resistors

Excess energy in the DC link is dissipated in the braking resistor. The braking resistors are designed for use with the SINAMICS G120C. This has an integrated braking chopper (electronic switch). For the electromagnetically compatible connection of an optionally connectable braking resistor, the corresponding shield connection kit is to be ordered for frame sizes FSD to FSF.

Load-side power components

Output reactors

Output reactors reduce the rate of voltage rise (dv/dt) and the height of the current peaks, and enable longer motor cables to be connected.

Sine-wave filter (for frame size FSAA)

Sine-wave filters limit the rate of voltage rise (dv/dt) and the peak voltages on the motor winding. Similar to an output reactor, they enable the connection of longer motor cables. A sine-wave filter 6SE6400-3TD00-4AD0, suitable for base mounting, is available for SINAMICS G120C, frame size FSAA, 0.55 kW to 2.2 kW. For 2.2 kW, operation of the sine-wave filter that is suitable for base mounting is only permitted for operating the inverter with rated power of 1.5 kW based on high overload (HO).

For technical specifications, see the datasheet on the Internet: <https://support.industry.siemens.com/cs/document/24479847>

Additional information is available in the Operating Instructions on the Internet at:

www.siemens.com/sinamics-g120c/documentation

Supplementary system components

IOP-2 Intelligent Operator Panel

Graphics-based, user-friendly and powerful operator panel for commissioning and diagnostics as well as local operator control and monitoring of SINAMICS G120C.

BOP-2 Basic Operator Panel

A 2-line display to provide support when commissioning and troubleshooting the drive. The drive can be locally controlled.

Memory card

The parameter settings for an inverter can be stored on the SINAMICS SD memory card. When service is required, e.g. after the inverter has been replaced and the data have been downloaded from the memory card, the drive system is immediately ready for use again. The associated memory card holder is integrated in the inverter.

Design (continued)

Supplementary system components (continued)

SINAMICS G120 Smart Access

Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to the optional web server module SINAMICS G120 Smart Access enabling user-friendly operation and easy access to the inverter, even if this is installed in areas difficult to access.

PC inverter connection kit 2

For controlling and commissioning an inverter directly from a PC if the STARTER commissioning tool or SINAMICS Startdrive has been installed on the PC.

Shield connection kits

A shield connection kit is included in the scope of delivery for frame sizes FSAA to FSC.

A set of shield plates is included in the scope of delivery for the motor and signal cables corresponding to the frame size for the frame sizes FSD to FSF. For the electromagnetically compatible connection of an optionally connectable braking resistor, the corresponding shield connection kit is to be ordered for frame sizes FSD to FSF.

Additional options

Further selected accessories are available from "Siemens Product Partner for Drives Options":

www.siemens.com/drives-options-partner

Spare parts

Shield connection kits

A shield connection kit is supplied as standard with frame sizes FSAA to FSC. These shield connection kits can also be ordered as spare parts.

A set of shield plates is included in the scope of delivery for the motor and signal cables corresponding to the frame size for the frame sizes FSD to FSF. For the electromagnetically compatible connection of an optionally connectable braking resistor, the corresponding shield connection kit is to be ordered for frame sizes FSD to FSF.

Spare parts kit

This kit comprises four I/O terminals, one RS485 terminal, two pairs of Control Unit doors (1 × PN and 1 × other communication versions) and one blanking cover.

Set of connectors

A set of connectors for the line feeder cable, braking resistor and motor cable can be ordered corresponding to the frame size of the SINAMICS G120C inverter.

Roof-mounted fan

A roof-mounted fan (at the top of the device) comprising a pre-assembled unit with holder and fan can be ordered corresponding to the frame size of the SINAMICS G120C.

Fan unit

A replacement fan (at the rear of the device; heat sink) comprising a pre-assembled unit with holder and fan can be ordered corresponding to the frame size of the SINAMICS G120C.

Configuration

The following electronic configuring aids and engineering tools are available for SINAMICS G120C compact inverters:

Drive Technology Configurator (DT Configurator) within the CA 01

The interactive catalog CA 01 – the offline Industry Mall of Siemens – contains over 100000 products with approximately 5 million possible drive system product variants. The Drive

Technology Configurator (DT Configurator) has been developed to facilitate selection of the correct motor and/or inverter from the wide spectrum of drives. It is integrated as a selection tool in Catalog CA 01.

Online DT Configurator

In addition, the DT Configurator can be used on the Internet without requiring any installation. The DT Configurator can be found in the Siemens Industry Mall at the following address:

www.siemens.com/dt-configurator

SIZER for Siemens Drives engineering tool

The SIZER for Siemens Drives engineering tool makes it easy to configure the SINAMICS drive family. It provides support when selecting the hardware and firmware components necessary to implement a drive task. SIZER for Siemens Drives is designed to support configuring of the entire drive system.

You can find further information on the SIZER for Siemens Drives engineering tool in the section Engineering tools.

The SIZER for Siemens Drives engineering tool is available free on the Internet at

www.siemens.com/sizer

STARTER commissioning tool

The STARTER commissioning tool allows menu-prompted commissioning, optimization and diagnostics. Apart from the SINAMICS drives, STARTER is also suitable for MICROMASTER 4 devices.

You can find further information about the STARTER commissioning tool in the section Engineering tools.

Additional information about the STARTER commissioning tool is available on the Internet at

www.siemens.com/starter

SINAMICS Startdrive commissioning tool

SINAMICS Startdrive is a tool for configuring, commissioning, and diagnosing the SINAMICS family of drives and is integrated into the TIA Portal. SINAMICS Startdrive can be used to implement drive tasks with the SINAMICS G110M, SINAMICS G120, SINAMICS G120C, SINAMICS G120D and SINAMICS G120P inverter series. The commissioning tool has been optimized with regard to user friendliness and consistent use of the TIA Portal benefits of a common working environment for PLC, HMI and drives.

You can find further information on the SINAMICS Startdrive commissioning tool in the section Engineering tools.

The SINAMICS Startdrive commissioning tool is available free on the Internet at

www.siemens.com/startdrive

Drive ES engineering system

Drive ES is the engineering system that can be used to integrate the communication, configuration and data management functions of Siemens drive technology into the SIMATIC automation world easily, efficiently and cost-effectively. Two software packages are available for SINAMICS – Drive ES Basic Maintenance and Drive ES PCS.

You can find further information about the Drive ES engineering system in the section Engineering tools.

Additional information about the Drive ES engineering system is available on the Internet at

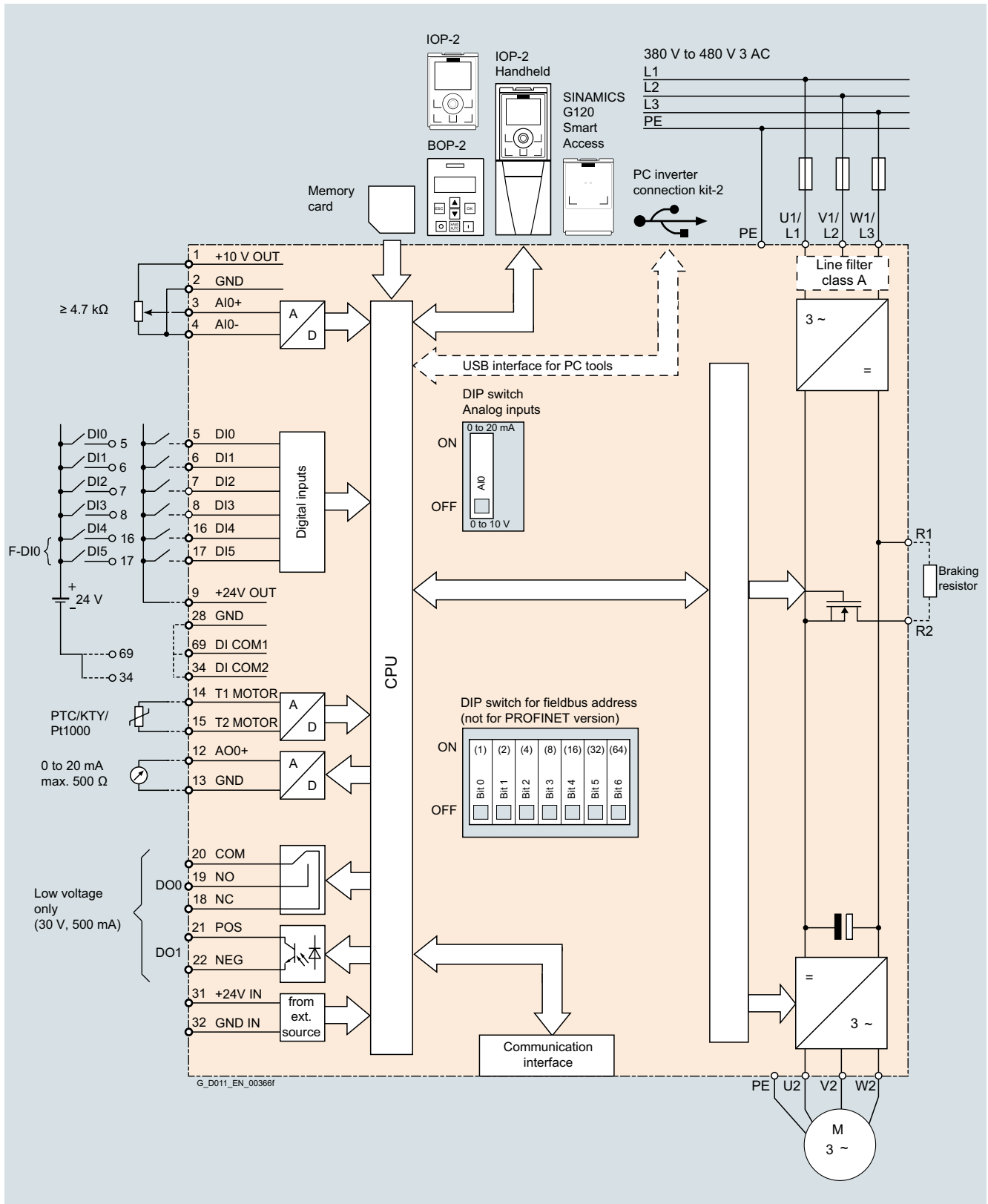
www.siemens.com/drive-es

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

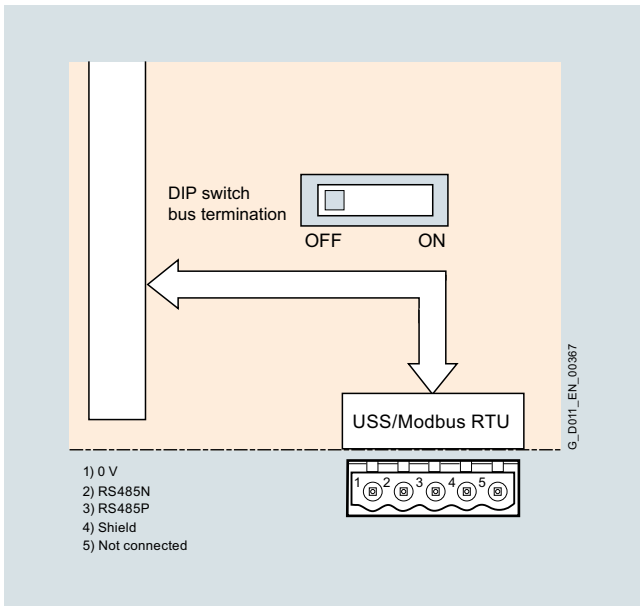
SINAMICS G120C compact inverters

Integration

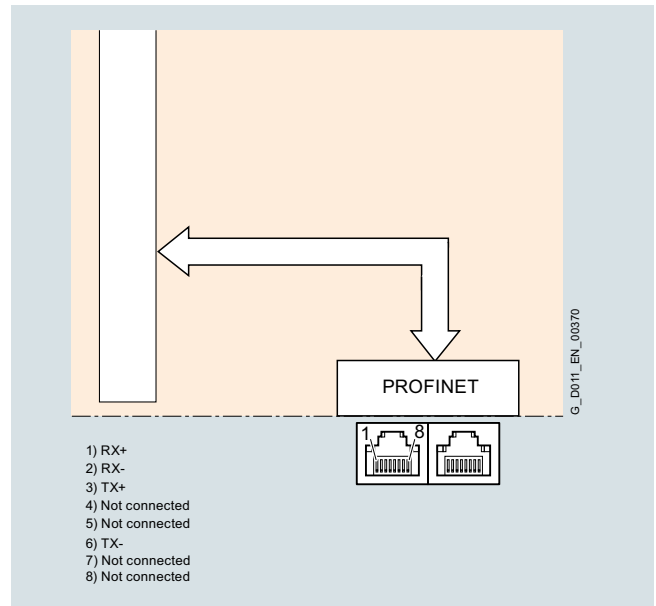


Connection example for SINAMICS G120C

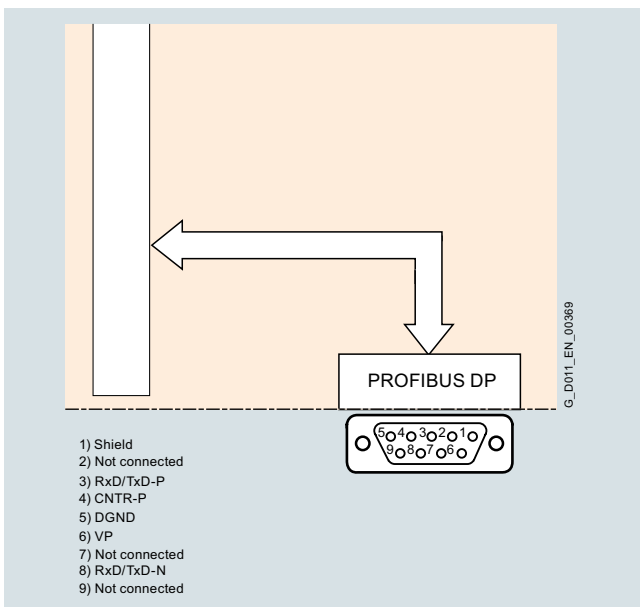
Integration (continued)



USS/Modbus RTU communication interface



PROFINET, EtherNet/IP communication interface



PROFIBUS DP communication interface

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Integration (continued)

Available optional power and DC link components

The following line-side components, DC link components and load-side power components are optionally available in the appropriate frames sizes:

| | Frame size | | | | | |
|-----------------------------------|-----------------|-----|-----|-----|-----|-----|
| | FSA, FSA | FSB | FSC | FSD | FSE | FSF |
| Line-side components | | | | | | |
| Line filter class A | F | F | F | F | F | F |
| Line filter class B | U ¹⁾ | U | U | – | – | – |
| Line reactor | S ¹⁾ | S | S | I | I | I |
| DC link components | | | | | | |
| Braking resistor | S ¹⁾ | S | S | S | S | S |
| Load-side power components | | | | | | |
| Output reactor | S ¹⁾ | S | S | S | S | S |
| Sine-wave filter | 1) | – | – | – | – | – |

U = Base component
 I = Integrated
 S = Lateral mounting
 F = Inverter available with and without integrated filter class A
 – = Not possible

Maximum permissible cable lengths from the motor to the inverter when using output reactors or line filters

The following load-side power components are optionally available in the appropriate frame sizes and result in the following maximum cable lengths, if necessary in combination with line filters for complying with EMC requirements:

| | Maximum permissible motor cable lengths (shielded/unshielded) in m (ft) | | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------|------------------------------------|-------------------------------------|
| | FSA | FSA | FSB | FSC | FSD | FSE | FSF |
| Without optional power components | | | | | | | |
| • Versions without integrated line filter | 150 ²⁾ /150 (492 ²⁾ /492) | 150/150 (492/492) | 150/150 (492/492) | 150/150 (492/492) | 200/300 (656/984) | 200/300 (656/984) | 300/450 (984/1476) |
| • Versions with integrated line filter class A | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) | 200/300 (656/984) | 200/300 (656/984) | 300/450 (984/1476) |
| With optional output reactor | | | | | | | |
| • At 380 ... 415 V 3 AC | 150/225 (492/738) | 150/225 (492/738) | 150/225 (492/738) | 150/225 (492/738) | 200/300 (656/984) ⁵⁾ | 200/300 (656/984) ⁵⁾ | 300/450 (984/1476) ⁵⁾ |
| • At 440 ... 480 V 3 AC | 100/150 (328/492) | 100/150 (328/492) | 100/150 (328/492) | 100/150 (328/492) | 200/300 (656/984) ⁵⁾ | 200/300 (656/984) ⁵⁾ | 300/450 (984/1476) ⁵⁾ |
| With integrated line filter class A According to EN 55011 to comply with radio interference emissions according to EN 61800-3 EMC Category C2 | 25 ³⁾ /– (82 ³⁾ /–) | 25 ³⁾ /– (82 ³⁾ /–) | 25 ³⁾ /– (82 ³⁾ /–) | 25 ⁴⁾ /– (82 ⁴⁾ /–) | 150/– (492/–) | 150/– (492/–) | 150/– (492/–) |
| With optional, external line filter class B According to EN 55011 to comply with cable-conducted radio interference emissions according to EN 61800-3 EMC Category C1 ⁶⁾ , together with versions without integrated line filters | 50/– (164/–) | 25/– (82/–) | 50/– (164/–) | 50/– (164/–) | – | – | – |
| With optional, external line filter class B According to EN 55011 and output reactor to comply with radio interference emissions according to EN 61800-3 EMC Category C2 ⁶⁾ , together with versions without integrated line filters | | | | | | | |
| • At 380 ... 415 V 3 AC | 150/– (492/–) | 150/– (492/–) | 150/– (492/–) | 150/– (492/–) | – | – | – |
| • At 440 ... 480 V 3 AC | 100/– (328/–) | 100/– (328/–) | 100/– (328/–) | 100/– (328/–) | – | – | – |

¹⁾ Line filters, line reactors, braking resistors, output reactors and sine-wave filters that are suitable for base mounting are also available for SINAMICS G120C, frame size FSA, 0.55 kW to 2.2 kW. For 2.2 kW, operation of the line reactors, braking resistors, output reactors and sine-wave filters that are suitable for base mounting is only permitted for operating the inverter with rated power of 1.5 kW based on high overload (HO).
 More information is available in the operating instructions on the Internet at: www.siemens.com/sinamics-g120c/documentation

²⁾ For SINAMICS G120C frame size FSA 2.2 kW with low-capacitance CY cable 150 m (492 ft) (shielded) – otherwise 125 m (410 ft) (shielded).

³⁾ With low-capacitance CY cable 50 m (164 ft) (shielded).

⁴⁾ With low-capacitance CY cable 100 m (328 ft) (shielded).

⁵⁾ For frame sizes FSD to FSF the maximum permissible cable lengths are not increased with an output reactor. By means of the output reactor, the loading of the motor windings is reduced by lower rates of voltage rise (dv/dt). By means of two output reactors connected in series, the maximum permissible cable lengths for frame sizes FSD and FSE are increased to 350 m (1148 ft) (shielded) and 525 m (1723 ft) (unshielded), and for frame size FSF to 525 m (1723 ft) (shielded) and 800 m (2625 ft) (unshielded).

⁶⁾ More information is available in the operating instructions on the Internet at: www.siemens.com/sinamics-g120c/documentation

Selection and ordering data

The article number is selected corresponding to

- the required motor power or the motor current required and the overload requirements of the application,
- the necessary EMC classification and
- the required integrated fieldbus interface

| Rated power ¹⁾ | | Base-load current I_L ²⁾ | Base-load current I_H ³⁾ | Frame size | Version | SINAMICS G120C without line filter | SINAMICS G120C with integrated line filter class A |
|---------------------------|------|---------------------------------------|---------------------------------------|------------|-----------------------|---------------------------------------|----------------------------------------------------------|
| kW | hp | A | A | | | Article No. | Article No. |
| 380 ... 480 V 3 AC | | | | | | | |
| 0.55 | 0.75 | 1.7 | 1.3 | FSA | USS, Modbus RTU | 6SL3210-1KE11-8UB2 | 6SL3210-1KE11-8AB2 |
| | | | | | PROFIBUS DP | 6SL3210-1KE11-8UP2 | 6SL3210-1KE11-8AP2 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE11-8UF2 | 6SL3210-1KE11-8AF2 |
| 0.75 | 1 | 2.2 | 1.7 | FSA | USS, Modbus RTU | 6SL3210-1KE12-3UB2 | 6SL3210-1KE12-3AB2 |
| | | | | | PROFIBUS DP | 6SL3210-1KE12-3UP2 | 6SL3210-1KE12-3AP2 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE12-3UF2 | 6SL3210-1KE12-3AF2 |
| 1.1 | 1.5 | 3.1 | 2.2 | FSA | USS, Modbus RTU | 6SL3210-1KE13-2UB2 | 6SL3210-1KE13-2AB2 |
| | | | | | PROFIBUS DP | 6SL3210-1KE13-2UP2 | 6SL3210-1KE13-2AP2 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE13-2UF2 | 6SL3210-1KE13-2AF2 |
| 1.5 | 2 | 4.1 | 3.1 | FSA | USS, Modbus RTU | 6SL3210-1KE14-3UB2 | 6SL3210-1KE14-3AB2 |
| | | | | | PROFIBUS DP | 6SL3210-1KE14-3UP2 | 6SL3210-1KE14-3AP2 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE14-3UF2 | 6SL3210-1KE14-3AF2 |
| 2.2 | 3 | 5.6 | 4.1 | FSA | USS, Modbus RTU | 6SL3210-1KE15-8UB2 | 6SL3210-1KE15-8AB2 |
| | | | | | PROFIBUS DP | 6SL3210-1KE15-8UP2 | 6SL3210-1KE15-8AP2 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE15-8UF2 | 6SL3210-1KE15-8AF2 |
| 3 | 4 | 7.3 | 5.6 | FSA | USS, Modbus RTU | 6SL3210-1KE17-5UB1 | 6SL3210-1KE17-5AB1 |
| | | | | | PROFIBUS DP | 6SL3210-1KE17-5UP1 | 6SL3210-1KE17-5AP1 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE17-5UF1 | 6SL3210-1KE17-5AF1 |
| 4 | 5 | 8.8 | 7.3 | FSA | USS, Modbus RTU | 6SL3210-1KE18-8UB1 | 6SL3210-1KE18-8AB1 |
| | | | | | PROFIBUS DP | 6SL3210-1KE18-8UP1 | 6SL3210-1KE18-8AP1 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE18-8UF1 | 6SL3210-1KE18-8AF1 |
| 5.5 | 7.5 | 12.5 | 8.8 | FSB | USS, Modbus RTU | 6SL3210-1KE21-3UB1 | 6SL3210-1KE21-3AB1 |
| | | | | | PROFIBUS DP | 6SL3210-1KE21-3UP1 | 6SL3210-1KE21-3AP1 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE21-3UF1 | 6SL3210-1KE21-3AF1 |
| 7.5 | 10 | 16.5 | 12.5 | FSB | USS, Modbus RTU | 6SL3210-1KE21-7UB1 | 6SL3210-1KE21-7AB1 |
| | | | | | PROFIBUS DP | 6SL3210-1KE21-7UP1 | 6SL3210-1KE21-7AP1 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE21-7UF1 | 6SL3210-1KE21-7AF1 |
| 11 | 15 | 25 | 16.5 | FSC | USS, Modbus RTU | 6SL3210-1KE22-6UB1 | 6SL3210-1KE22-6AB1 |
| | | | | | PROFIBUS DP | 6SL3210-1KE22-6UP1 | 6SL3210-1KE22-6AP1 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE22-6UF1 | 6SL3210-1KE22-6AF1 |
| 15 | 20 | 31 | 25 | FSC | USS, Modbus RTU | 6SL3210-1KE23-2UB1 | 6SL3210-1KE23-2AB1 |
| | | | | | PROFIBUS DP | 6SL3210-1KE23-2UP1 | 6SL3210-1KE23-2AP1 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE23-2UF1 | 6SL3210-1KE23-2AF1 |
| 18.5 | 25 | 37 | 31 | FSC | USS, Modbus RTU | 6SL3210-1KE23-8UB1 | 6SL3210-1KE23-8AB1 |
| | | | | | PROFIBUS DP | 6SL3210-1KE23-8UP1 | 6SL3210-1KE23-8AP1 |
| | | | | | PROFINET, EtherNet/IP | 6SL3210-1KE23-8UF1 | 6SL3210-1KE23-8AF1 |
| 22 | 25 | 43 | 37 | FSD | PROFINET, EtherNet/IP | 6SL3210-1KE24-4UF1 | 6SL3210-1KE24-4AF1 |
| 30 | 30 | 58 | 43 | FSD | PROFINET, EtherNet/IP | 6SL3210-1KE26-0UF1 | 6SL3210-1KE26-0AF1 |
| 37 | 40 | 68 | 58 | FSD | PROFINET, EtherNet/IP | 6SL3210-1KE27-0UF1 | 6SL3210-1KE27-0AF1 |
| 45 | 50 | 82.5 | 68 | FSD | PROFINET, EtherNet/IP | 6SL3210-1KE28-4UF1 | 6SL3210-1KE28-4AF1 |
| 55 | 60 | 103 | 83 | FSE | PROFINET, EtherNet/IP | 6SL3210-1KE31-1UF1 | 6SL3210-1KE31-1AF1 |
| 75 | 75 | 136 | 103 | FSF | PROFINET, EtherNet/IP | 6SL3210-1KE31-4UF1 | 6SL3210-1KE31-4AF1 |
| 90 | 100 | 164 | 136 | FSF | PROFINET, EtherNet/IP | 6SL3210-1KE31-7UF1 | 6SL3210-1KE31-7AF1 |
| 110 | 125 | 201 | 164 | FSF | PROFINET, EtherNet/IP | 6SL3210-1KE32-1UF1 | 6SL3210-1KE32-1AF1 |
| 132 | 150 | 237 | 201 | FSF | PROFINET, EtherNet/IP | 6SL3210-1KE32-4UF1 | 6SL3210-1KE32-4AF1 |

¹⁾ The rated power of the device based on the rated output current I_L and a rated input voltage of 400 V 3 AC. The rated power is specified on the device rating plate.

²⁾ The base-load current I_L is based on the duty cycle for low overload (LO). The current value is specified on the device rating plate.

³⁾ The base-load current I_H is based on the duty cycle for high overload (HO). The current value is not specified on the device rating plate.

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Selection and ordering data (continued)

Optional firmware memory cards for SINAMICS G120C

| Description | Article No. |
|----------------------------------------------------------------------------------|-------------------------------|
| SINAMICS SD card 512 MB + firmware V4.7 SP10 (Multicard V4.7 SP10) | NEW 6SL3054-7TF00-2BA0 |

For an overview and more information on all available firmware versions, see <https://support.industry.siemens.com/cs/document/67364620>

Notes:

SINAMICS G120C compact inverters with frame size FSAA can be operated as of firmware V4.7 SP3.

SINAMICS G120C compact inverters with frame sizes FSD to FSF can be operated as of firmware V4.7 SP6.

Technical specifications

Unless explicitly specified otherwise, the following technical specifications are valid for all SINAMICS G120C compact inverters.

| General technical specifications | |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mechanical specifications | |
| Vibratory load | |
| • Transport acc. to EN 60721-3-2 ¹⁾ | Class 1M2 |
| • Operation acc. to EN 60721-3-3 | Class 3M1 |
| Shock load | |
| • Transport acc. to EN 60721-3-2 ¹⁾ | Class 1M2 |
| • Operation acc. to EN 60721-3-3 | Class 3M2 |
| Degree of protection | IP20/ UL open type |
| Permissible mounting position | Vertical wall mounting |
| Ambient conditions | |
| Protection class According to EN 61800-5-1 | Class III (PELV1) |
| Touch protection According to EN 61800-5-1 | Class I (with protective conductor system) |
| Humidity, max. | 95 % at 40 °C (104 °F), condensation and icing not permissible |
| Ambient temperature | |
| • Storage ¹⁾ acc. to EN 60068-2-1 | -40 ... +70 °C (-40 ... +158 °F) |
| • Transport ¹⁾ acc. to EN 60068-2-1 | -40 ... +70 °C (-40 ... +158 °F) |
| • Operation acc. to EN 60068-2-2 | |
| - Frame sizes FSAA to FSC | -10 ... +40 °C (14 ... 104 °F) without derating |
| - Frame sizes FSD to FSF | -20 ... +40 °C (-4 ... +104 °F) without derating |
| - All frame sizes | >40 ... 50 °C (104 ... 122 °F) see derating characteristics |
| - All frame sizes with operator panel | 0 ... 50 °C (32 ... 122 °F) see also derating characteristics |
| Environmental class in operation | |
| • Harmful chemical substances | Class 3C2 to EN 60721-3-3 |
| • Organic/biological pollutants | Class 3B1 to EN 60721-3-3 |
| • Degree of pollution | 2 acc. to EN 61800 |
| Standards | |
| Compliance with standards ²⁾ | CE, UL, cUL, RCM, SEMI F47, RoHS, EAC |
| Fail-safe certification | Function: Safe Torque Off (STO) |
| • According to IEC 61508 | SIL 2 |
| • According to EN ISO 13849-1 | PL d and Category 3 |
| CE marking, according to | EMC Directive 2014/30/EU Low Voltage Directive 2014/35/EU |
| EMC Directive ²⁾ According to EN 61800-3 | |
| Interference immunity | The SINAMICS G120C compact inverters are tested according to the interference immunity requirements for environments according to Category C3. |
| Interference emissions | |
| • Frame sizes FSAA to FSF without integrated line filter | ³⁾ |
| • Frame sizes FSAA to FSC with integrated line filter class A | Observance of the limit values according to Category C3 Observance of the limit values for conducted interferences and field-conducted interference emissions according to Category C2 ⁴⁾⁵⁾ |
| • Frame sizes FSAA to FSC without integrated line filter with optional line filter class B | Observance of the limit values for conducted interferences according to Category C1 and field-conducted interference emissions according to Category C2 ⁴⁾⁵⁾ |
| • Frame sizes FSD to FSF with integrated line filter class A | Observance of the limit values according to Category C3 and C2 ⁴⁾ |
| | Note: The EMC product standard EN 61800-3 does not apply directly to a frequency inverter but to a PDS (Power Drive System), which comprises the complete circuitry, motor and cables in addition to the inverter. The frequency inverters on their own do not generally require identification according to the EMC Directive. |

¹⁾ In product packaging.

²⁾ More information is available in the operating instructions on the Internet at: www.siemens.com/sinamics-g120c/documentation

³⁾ Non-filtered devices are designed for operation in IT systems or in conjunction with an RCD. The customer must provide suitable RI suppression equipment to ensure that these devices comply with the limits defined for Category C3 or C2.

⁴⁾ Max. permissible cable lengths [see Technical specifications for power electronics](#).

⁵⁾ SINAMICS G120C compact inverters, frame size FSB, with PROFINET interface (Article No.: 6SL3210-1KE21-AF1) additionally require a line reactor.

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Technical specifications (continued)

| SINAMICS G120C compact inverter | USS, Modbus RTU version | PROFIBUS DP version | PROFINET, EtherNet/IP version |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | 6SL3210-1KE...B1 6SL3210-1KE...B2 | 6SL3210-1KE...P1 6SL3210-1KE...P2 | 6SL3210-1KE...F1 6SL3210-1KE...F2 |
| Integrated bus interface | | | |
| Fieldbus protocols | <ul style="list-style-type: none"> USS Modbus RTU (switchable using a parameter) | PROFIBUS DP | <ul style="list-style-type: none"> PROFINET EtherNet/IP <ul style="list-style-type: none"> - ODVA AC/DC drive - SINAMICS profiles |
| Profiles | – | <ul style="list-style-type: none"> PROFIdrive Profile V4.1 PROFIsafe | <ul style="list-style-type: none"> PROFIdrive Profile V4.1 PROFIsafe PROFInergy |
| Hardware | Plug-in terminal, insulated, USS: max. 187.5 kBaud, Modbus RTU: 19.2 kBaud, Bus terminating resistor that can be switched in | 9-pin SUB-D socket, insulated, max. 12 Mbit/s, Slave address can be set using DIP switches | 2 × RJ45, max. 100 Mbit/s (full duplex), device name can be stored on the device |
| I/O interfaces | | | |
| Signal cable cross-section | 0.15 ... 1.5 mm ² (28 ... 16 AWG) | | |
| Digital inputs – Standard | 6 isolated inputs Optically isolated; Free reference potential (own potential group) NPN/PNP logic can be selected using the wiring | | |
| <ul style="list-style-type: none"> Switching level: 0 → 1 Switching level: 1 → 0 | 11 V 5 V | | |
| Digital inputs, fail-safe | 1 When using the standard digital inputs (DI4+DI5) Safety function: Safe Torque Off (STO) | | |
| Digital outputs | 1 relay changeover contact 30 V DC, 0.5 A (ohmic load) 1 transistor 30 V DC, 0.5 A (ohmic load) | | |
| Analog inputs | 1 analog input Differential input Switchable between voltage (-10 ... +10 V) and current (0/4 ... 20 mA) using a DIP switch 10-bit resolution Can be used as additional digital input Analog inputs are protected in a voltage range of ± 30 V and have a common-mode voltage in the ± 15 V range. | | |
| <ul style="list-style-type: none"> Switching threshold: 0 → 1 Switching threshold: 1 → 0 | 4 V 1.6 V | | |
| Analog outputs | 1 analog output Non-isolated output Switchable between voltage (0 ... 10 V) and current (0/4 ... 20 mA) using a parameter Voltage mode: 10 V, min. burden 10 kΩ Current mode: 20 mA, max. burden 500 Ω The analog outputs have short-circuit protection | | |
| PTC/KTY interface | 1 motor temperature sensor input Connectable sensors PTC, Pt1000, KTY and bimetal, accuracy ±5 °C | | |
| Voltage supply for the integrated Control Unit | 24 V DC via the Power Module or by connecting to an external 20.4 ... 28.8 V DC power supply Typical input current: 500 mA at 24 V DC | | |
| Tool interfaces | | | |
| Memory card | Optional SINAMICS SD card | | |
| Operator panels | Optional BOP-2 Basic Operator Panel or Intelligent Operator Panel IOP-2 or SINAMICS G120 Smart Access | | |
| PC interface | USB | | |

Technical specifications (continued)

| SINAMICS G120C compact inverter | |
|------------------------------------------------------------------------|--------------------------------------------------|
| Open-loop/closed-loop control techniques | |
| V/f linear/quadratic/parameterizable | ✓ |
| V/f with flux current control (FCC) | ✓ |
| V/f ECO; linear/quadratic | ✓ |
| Vector control, sensorless | ✓ |
| Vector control, with sensor | – |
| Torque control, sensorless | – |
| Torque control, with sensor | – |
| Software functions | |
| Setpoint input | ✓ |
| Fixed frequencies | 16, parameterizable |
| JOG | ✓ |
| Digital motorized potentiometer (MOP) | ✓ |
| Ramp smoothing | ✓ |
| Extended ramp-function generator (with ramp smoothing Off3) | ✓ |
| Positioning down ramp | – |
| Slip compensation | ✓ |
| Signal interconnection with BICO technology | ✓ |
| Free function blocks (FFB) for logical and arithmetic operations | ✓ |
| Switchable drive data sets (DDS) | ✓ (2) |
| Switchable command data sets (CDS) | ✓ (2) |
| Flying restart | ✓ |
| Automatic restart after line supply failure or operating fault (AR) | ✓ |
| Technology controller (internal PID) | ✓ |
| Energy consumption counter | ✓ |
| Energy saving computer | ✓ |
| Thermal motor protection | ✓ (I^2t sensor: PTC, Pt1000, KTY and bimetal) |
| Thermal inverter protection | ✓ |
| Motor identification | ✓ |
| Motor holding brake | ✓ |
| Auto-ramping (V_{dc_max} controller) | ✓ |
| Kinetic buffering (V_{dc_min} controller) | ✓ |
| Braking functions | |
| • DC braking | ✓ |
| • Compound braking | ✓ |
| • Dynamic braking with integrated braking chopper | ✓ |

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Technical specifications (continued)

| General technical specifications of the power electronics | |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System operating voltage | 380 ... 480 V 3 AC +10 % -20 % |
| Line supply requirements | No restriction |
| Short-circuit power ratio R_{SC} | |
| Input frequency | 47 ... 63 Hz |
| Output frequency | |
| • Control mode V/f | 0 ... 550 Hz |
| • Control mode Vector | 0 ... 240 Hz |
| Pulse frequency | 4 kHz, 2 kHz for inverters with a rated power ≥ 75 kW Higher pulse frequencies up to 16 kHz see derating data |
| Power factor λ | |
| • Frame sizes FSAA to FSC | 0.7 ... 0.85 |
| • Frame sizes FSD to FSF | >0.9 |
| Offset factor $\cos \varphi$ | ≥ 0.95 |
| Output voltage, max. as % of input voltage | 95 % |
| Overload capability | |
| • Low overload LO Note: No reduction in base-load current I_L for use of overload | 1.5 \times base-load current I_L (i. e. 150 % overload) for 3 s plus 1.1 \times base-load current I_L (i. e. 110 % overload) for 57 s within a cycle time of 300 s |
| • High overload HO Note: No reduction in base-load current I_H for use of overload | 2 \times base-load current I_H (i. e. 200 % overload) for 3 s plus 1.5 \times base-load current I_H (i. e. 150 % overload) for 57 s within a cycle time of 300 s |
| Cooling | Air cooling using an integrated fan |
| Installation altitude | Up to 1000 m (3281 ft) above sea level without derating, > 1000 m (3281 ft) see derating characteristics |
| Short Circuit Current Rating (SCCR) ¹⁾, max. acc. to UL | 100 kA See Recommended line-side overcurrent protection devices – the value depends on the fuses and circuit breakers used |
| Protection functions | <ul style="list-style-type: none">• Undervoltage• Overvoltage• Overload• Ground fault• Short-circuit• Stall protection• Motor blocking protection• Motor overtemperature• Inverter overtemperature |

¹⁾ Applies to industrial control panel installations to NEC Article 409 or UL 508A.

Technical specifications (continued)

| Line voltage 380 ... 480 V 3 AC | | SINAMICS G120C power electronics | | | | |
|-------------------------------------------------------|-----------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| | | 6SL3210-1KE11-8..2 | 6SL3210-1KE12-3..2 | 6SL3210-1KE13-2..2 | 6SL3210-1KE14-3..2 | |
| Output current at 400 V 3 AC | | | | | | |
| • Rated current I_{rated} ¹⁾ | A | 1.8 | 2.3 | 3.2 | 4.3 | |
| • Base-load current I_L ²⁾ | A | 1.7 | 2.2 | 3.1 | 4.1 | |
| • Base-load current I_H ³⁾ | A | 1.3 | 1.7 | 2.2 | 3.1 | |
| • Maximum current I_{max} | A | 2.6 | 3.4 | 4.4 | 6.2 | |
| Rated power | | | | | | |
| • Based on I_L | kW (hp) | 0.55 (0.75) | 0.75 (1) | 1.1 (1.5) | 1.5 (2) | |
| • Based on I_H | kW | 0.37 | 0.55 | 0.75 | 1.1 | |
| Rated pulse frequency | | kHz | 4 | 4 | 4 | |
| Efficiency η | | % | 97 | 97 | 97 | |
| Power loss⁴⁾ at rated current | | kW | 0.034 | 0.039 | 0.049 | 0.062 |
| Cooling air requirement | | m ³ /s (ft ³ /s) | 0.005 (0.18) | 0.005 (0.18) | 0.005 (0.18) | 0.005 (0.18) |
| Sound pressure level L_{pA} (1 m) | | dB | <49 | <49 | <49 | <49 |
| Rated input current⁵⁾ | | | | | | |
| • Based on I_L | A | 2.3 | 2.9 | 4.1 | 5.5 | |
| • Based on I_H | A | 1.9 | 2.5 | 3.2 | 4.5 | |
| Length of cable to braking resistor, max. | | m (ft) | 15 (49) | 15 (49) | 15 (49) | 15 (49) |
| Line supply connection U1/L1, V1/L2, W1/L3 | | | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals |
| • Conductor cross-section | mm ² | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) |
| Motor connection U2, V2, W2 | | | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals |
| • Conductor cross-section | mm ² | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) |
| Connection for braking resistor R1, R2 | | | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals |
| • Conductor cross-section | mm ² | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) |
| PE connection | | | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw |
| Motor cable length, max.⁶⁾ | | | | | | |
| • Without filter, shielded/unshielded | m (ft) | 150/150 (492/492) | 150/150 (492/492) | 150/150 (492/492) | 150/150 (492/492) | 150/150 (492/492) |
| • With integrated filter class A, shielded/unshielded | m (ft) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) |
| Dimensions | | | | | | |
| • Width | mm (in) | 73 (2.87) | 73 (2.87) | 73 (2.87) | 73 (2.87) | 73 (2.87) |
| • Height | mm (in) | 173 (6.81) | 173 (6.81) | 173 (6.81) | 173 (6.81) | 173 (6.81) |
| • Depth | | | | | | |
| - Without operator panel | mm (in) | 155 (6.10) (PN version: 178 (7.01)) | 155 (6.10) (PN version: 178 (7.01)) | 155 (6.10) (PN version: 178 (7.01)) | 155 (6.10) (PN version: 178 (7.01)) | 155 (6.10) (PN version: 178 (7.01)) |
| - With BOP-2/IOP-2 | mm (in) | 166 (6.54) (PN version: 189 (7.44)) | 166 (6.54) (PN version: 189 (7.44)) | 166 (6.54) (PN version: 189 (7.44)) | 166 (6.54) (PN version: 189 (7.44)) | 166 (6.54) (PN version: 189 (7.44)) |
| Frame size | | | FSAA | FSAA | FSAA | FSAA |
| Weight, approx. | | | | | | |
| • Without filter | kg (lb) | 1.1 (2.43) (PN version: 1.2 (2.65)) | 1.1 (2.43) (PN version: 1.2 (2.65)) | 1.1 (2.43) (PN version: 1.2 (2.65)) | 1.1 (2.43) (PN version: 1.2 (2.65)) | 1.1 (2.43) (PN version: 1.2 (2.65)) |
| • With integrated filter class A | kg (lb) | 1.3 (2.87) (PN version: 1.4 (3.09)) | 1.3 (2.87) (PN version: 1.4 (3.09)) | 1.3 (2.87) (PN version: 1.4 (3.09)) | 1.3 (2.87) (PN version: 1.4 (3.09)) | 1.3 (2.87) (PN version: 1.4 (3.09)) |

1) The rated output current I_{rated} can be used up to 100 %; however, without overload.

2) The base-load current I_L is based on the duty cycle for low overload (LO).

3) The base-load current I_H is based on the duty cycle for high overload (HO).

4) Typical values. More information can be found on the Internet at <https://support.industry.siemens.com/cs/document/94059311>

5) The rated input currents are valid for an input voltage of 400 V 3 AC and a line impedance corresponding to $u_K = 1\%$ (without line reactor). The rated input current based on I_L is stamped on the inverter rating plate. In the particular application, the input current depends on the motor load and line impedance. The input current is reduced when using a line reactor.

6) The maximum motor cable lengths are valid for an input voltage of 400 V 3 AC and operation with a 4 kHz pulse frequency. When an inverter with an integrated line filter class A is used to comply with the limits of EN 61800-3 Category C2 for line-conducted interference emission, the maximum permissible motor cable length is 25 m (82 ft) (shielded) as standard – and 50 m (164 ft) with low-capacitance CY cable (shielded).

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Technical specifications (continued)

| Line voltage 380 ... 480 V 3 AC | | SINAMICS G120C power electronics | | | |
|-------------------------------------------------------|----------------------------------------|-------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| | | 6SL3210-1KE15-8..2 | 6SL3210-1KE17-5..1 | 6SL3210-1KE18-8..1 | 6SL3210-1KE21-3..1 |
| Output current at 400 V 3 AC | | | | | |
| • Rated current I_{rated} ¹⁾ | A | 5.8 | 7.5 | 9 | 13 |
| • Base-load current I_L ²⁾ | A | 5.6 | 7.3 | 8.8 | 12.5 |
| • Base-load current I_H ³⁾ | A | 4.1 | 5.6 | 7.3 | 8.8 |
| • Maximum current I_{max} | A | 8.2 | 11.2 | 14.6 | 17.6 |
| Rated power | | | | | |
| • Based on I_L | kW (hp) | 2.2 (3) | 3 (4) | 4 (5) | 5.5 (7.5) |
| • Based on I_H | kW | 1.5 | 2.2 | 3 | 4 |
| Rated pulse frequency | | | | | |
| | kHz | 4 | 4 | 4 | 4 |
| Efficiency η | | | | | |
| | % | 97 | 97 | 97 | 97 |
| Power loss⁴⁾ at rated current | | | | | |
| | kW | 0.073 | 0.099 | 0.122 | 0.174 |
| Cooling air requirement | | | | | |
| | m ³ /s (ft ³ /s) | 0.005 (0.18) | 0.005 (0.18) | 0.005 (0.18) | 0.009 (0.32) |
| Sound pressure level L_{pA} (1 m) | | | | | |
| | dB | <49 | <52 | <52 | <63 |
| Rated input current⁵⁾ | | | | | |
| • Based on I_L | A | 7.4 | 9.5 | 11.4 | 16.5 |
| • Based on I_H | A | 6 | 8.2 | 10.6 | 12.8 |
| Length of cable to braking resistor, max. | | | | | |
| | m (ft) | 15 (49) | 15 (49) | 15 (49) | 15 (49) |
| Line supply connection U1/L1, V1/L2, W1/L3 | | | | | |
| • Conductor cross-section | mm ² | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 4 ... 6 (12 ... 10 AWG) |
| Motor connection U2, V2, W2 | | | | | |
| • Conductor cross-section | mm ² | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 4 ... 6 (12 ... 10 AWG) |
| Connection for braking resistor R1, R2 | | | | | |
| • Conductor cross-section | mm ² | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 1 ... 2.5 (18 ... 14 AWG) | 4 ... 6 (12 ... 10 AWG) |
| PE connection | | | | | |
| | | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw |
| Motor cable length, max.⁶⁾ | | | | | |
| • Without filter, shielded/unshielded | m (ft) | 125 ⁷⁾ /150 (410 ⁷⁾ /492) | 150/150 (492/492) | 150/150 (492/492) | 150/150 (492/492) |
| • With integrated filter class A, shielded/unshielded | m (ft) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) |
| Dimensions | | | | | |
| • Width | mm (in) | 73 (2.87) | 73 (2.87) | 73 (2.87) | 100 (3.94) |
| • Height | mm (in) | 173 (6.81) | 196 (7.72) | 196 (7.72) | 196 (7.72) |
| • Depth | | | | | |
| - Without operator panel | mm (in) | 155 (6.10) (PN version: 178 (7.01)) | 203 (7.99) (PN version: 226 (8.90)) | 203 (7.99) (PN version: 226 (8.90)) | 203 (7.99) (PN version: 226 (8.90)) |
| - With BOP-2/IOP-2 | mm (in) | 166 (6.54) (PN version: 189 (7.44)) | 214 (8.43) (PN version: 237 (9.33)) | 214 (8.43) (PN version: 237 (9.33)) | 214 (8.43) (PN version: 237 (9.33)) |
| Frame size | | | | | |
| | | FSA | FSA | FSA | FSB |
| Weight, approx. | | | | | |
| • Without filter | kg (lb) | 1.1 (2.43) (PN version: 1.2 (2.65)) | 1.7 (3.75) | 1.7 (3.75) | 2.3 (5.07) |
| • With integrated filter class A | kg (lb) | 1.3 (2.87) (PN version: 1.4 (3.09)) | 1.9 (4.19) | 1.9 (4.19) | 2.5 (5.51) |

1) The rated output current I_{rated} can be used up to 100 %; however, without overload.

2) The base-load current I_L is based on the duty cycle for low overload (LO).

3) The base-load current I_H is based on the duty cycle for high overload (HO).

4) Typical values. More information can be found on the Internet at <https://support.industry.siemens.com/cs/document/94059311>

5) The rated input currents are valid for an input voltage of 400 V 3 AC and a line impedance corresponding to $u_K = 1\%$ (without line reactor). The rated input current based on I_L is stamped on the inverter rating plate. In the particular application, the input current depends on the motor load and line impedance. The input current is reduced when using a line reactor.

6) The maximum motor cable lengths are valid for an input voltage of 400 V 3 AC and operation with a 4 kHz pulse frequency. When an inverter with an integrated line filter class A is used to comply with the limits of EN 61800-3 Category C2 for line-conducted interference emissions, the maximum permissible motor cable length is 25 m (82 ft) (shielded) as standard – for frame sizes FSA to FSB with low-capacitance CY cable (shielded) it is 50 m (164 ft).

7) With low-capacitance CY cable 150 m (492 ft) (shielded).

Technical specifications (continued)

| Line voltage 380 ... 480 V 3 AC | | SINAMICS G120C power electronics | | | |
|-------------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| | | 6SL3210-1KE21-7..1 | 6SL3210-1KE22-6..1 | 6SL3210-1KE23-2..1 | 6SL3210-1KE23-8..1 |
| Output current at 400 V 3 AC | | | | | |
| • Rated current I_{rated} ¹⁾ | A | 17 | 26 | 32 | 38 |
| • Base-load current I_L ²⁾ | A | 16.5 | 25 | 31 | 37 |
| • Base-load current I_H ³⁾ | A | 12.5 | 16.5 | 25 | 31 |
| • Maximum current I_{max} | A | 25 | 33 | 50 | 62 |
| Rated power | | | | | |
| • Based on I_L | kW (hp) | 7.5 (10) | 11 (15) | 15 (20) | 18.5 (25) |
| • Based on I_H | kW | 5.5 | 7.5 | 11 | 15 |
| Rated pulse frequency | kHz | 4 | 4 | 4 | 4 |
| Efficiency η | % | 97 | 97 | 97 | 97 |
| Power loss ⁴⁾ at rated current | kW | 0.236 | 0.301 | 0.373 | 0.45 |
| Cooling air requirement | m ³ /s (ft ³ /s) | 0.009 (0.32) | 0.018 (0.64) | 0.018 (0.64) | 0.018 (0.64) |
| Sound pressure level L_{pA} (1 m) | dB | <63 | <66 | <66 | <66 |
| Rated input current ⁵⁾ | | | | | |
| • Based on I_L | A | 21.5 | 33 | 40.6 | 48.2 |
| • Based on I_H | A | 18.2 | 24.1 | 36.4 | 45.2 |
| Length of cable to braking resistor, max. | m (ft) | 15 (49) | 15 (49) | 15 (49) | 15 (49) |
| Line supply connection U1/L1, V1/L2, W1/L3 | | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals |
| • Conductor cross-section | mm ² | 4 ... 6 (12 ... 10 AWG) | 6 ... 16 (10 ... 5 AWG) | 10 ... 16 (7 ... 5 AWG) | 10 ... 16 (7 ... 5 AWG) |
| Motor connection U2, V2, W2 | | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals |
| • Conductor cross-section | mm ² | 4 ... 6 (12 ... 10 AWG) | 6 ... 16 (10 ... 5 AWG) | 10 ... 16 (7 ... 5 AWG) | 10 ... 16 (7 ... 5 AWG) |
| Connection for braking resistor R1, R2 | | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals | Plug-in screw terminals |
| • Conductor cross-section | mm ² | 4 ... 6 (12 ... 10 AWG) | 6 ... 16 (10 ... 5 AWG) | 10 ... 16 (7 ... 5 AWG) | 10 ... 16 (7 ... 5 AWG) |
| PE connection | | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw |
| Motor cable length, max. ⁶⁾ | | | | | |
| • Without filter, shielded/unshielded | m (ft) | 150/150 (492/492) | 150/150 (492/492) | 150/150 (492/492) | 150/150 (492/492) |
| • With integrated filter class A, shielded/unshielded | m (ft) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) | 50/100 (164/328) |
| Dimensions | | | | | |
| • Width | mm (in) | 100 (3.94) | 140 (5.51) | 140 (5.51) | 140 (5.51) |
| • Height | mm (in) | 196 (7.72) | 295 (11.61) | 295 (11.61) | 295 (11.61) |
| • Depth | | | | | |
| - Without operator panel | mm (in) | 203 (7.99) (PN version: 226 (8.90)) | 203 (7.99) (PN version: 226 (8.90)) | 203 (7.99) (PN version: 226 (8.90)) | 203 (7.99) (PN version: 226 (8.90)) |
| - With BOP-2/IOP-2 | mm (in) | 214 (8.43) (PN version: 237 (9.33)) | 214 (8.43) (PN version: 237 (9.33)) | 214 (8.43) (PN version: 237 (9.33)) | 214 (8.43) (PN version: 237 (9.33)) |
| Frame size | | FSB | FSC | FSC | FSC |
| Weight, approx. | | | | | |
| • Without filter | kg (lb) | 2.3 (5.07) | 4.4 (9.70) | 4.4 (9.70) | 4.4 (9.70) |
| • With integrated filter class A | kg (lb) | 2.5 (5.51) | 4.7 (10.4) | 4.7 (10.4) | 4.7 (10.4) |

1) The rated output current I_{rated} can be used up to 100 %; however, without overload.

2) The base-load current I_L is based on the duty cycle for low overload (LO).

3) The base-load current I_H is based on the duty cycle for high overload (HO).

4) Typical values. More information can be found on the Internet at <https://support.industry.siemens.com/cs/document/94059311>

5) The rated input currents are valid for an input voltage of 400 V 3 AC and a line impedance corresponding to $u_K = 1\%$ (without line reactor). The rated input current based on I_L is stamped on the inverter rating plate. In the particular application, the input current depends on the motor load and line impedance. The input current is reduced when using a line reactor.

6) The maximum motor cable lengths are valid for an input voltage of 400 V 3 AC and operation with a 4 kHz pulse frequency. When an inverter with an integrated line filter class A is used to comply with the limits of EN 61800-3 Category C2 for line-conducted interference emission, the maximum permissible motor cable length is 25 m (82 ft) (shielded) as standard – with low-capacitance CY cable for frame size FSB 50 m (164 ft) (shielded), for FSC 100 m (328 ft) (shielded).

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Technical specifications (continued)

| Line voltage 380 ... 480 V 3 AC | | SINAMICS G120C power electronics | | | | |
|-------------------------------------------------------|-----------------|----------------------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|
| | | 6SL3210-1KE24-4.F1 | 6SL3210-1KE26-0.F1 | 6SL3210-1KE27-0.F1 | 6SL3210-1KE28-4.F1 | |
| Output current at 400 V 3 AC | | | | | | |
| • Rated current I_{rated} ¹⁾ | A | 43 | 58 | 68 | 82.5 | |
| • Base-load current I_L ²⁾ | A | 43 | 58 | 68 | 82.5 | |
| • Base-load current I_H ³⁾ | A | 37 | 43 | 58 | 68 | |
| • Maximum current I_{max} | A | 74 | 87 | 116 | 136 | |
| Rated power | | | | | | |
| • Based on I_L | kW (hp) | 22 (25) | 30 (30) | 37 (40) | 45 (50) | |
| • Based on I_H | kW | 18.5 | 22 | 30 | 37 | |
| Rated pulse frequency | | kHz | 4 | 4 | 4 | |
| Efficiency η | | % | 98 | 98 | 98 | |
| Power loss⁴⁾ at rated current | | kW | 0.65 | 0.933 | 1.032 | 1.304 |
| Cooling air requirement | | m ³ /s (ft ³ /s) | 0.055 (1.94) | 0.055 (1.94) | 0.055 (1.94) | 0.055 (1.94) |
| Sound pressure level L_{pA} (1 m) | | dB | 71.6 | 71.6 | 71.6 | 71.6 |
| Rated input current⁵⁾ | | | | | | |
| • Based on I_L | A | 41 | 53 | 64 | 76 | |
| • Based on I_H | A | 39 | 44 | 61 | 69 | |
| Length of cable to braking resistor, max. | | m (ft) | 10 (32.8) | 10 (32.8) | 10 (32.8) | 10 (32.8) |
| Line supply connection U1/L1, V1/L2, W1/L3 | | | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | |
| Motor connection U2, V2, W2 | | | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | |
| Connection for braking resistor R1, R2 | | | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | 10 ... 35 (20 ... 10 AWG) | |
| PE connection | | | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw |
| Motor cable length, max.⁶⁾ | | | | | | |
| • Without filter, shielded/unshielded | m (ft) | 200/300 (656/984) | 200/300 (656/984) | 200/300 (656/984) | 200/300 (656/984) | |
| • With integrated filter class A, shielded/unshielded | m (ft) | 200/300 (656/984) | 200/300 (656/984) | 200/300 (656/984) | 200/300 (656/984) | |
| Dimensions | | | | | | |
| • Width | mm (in) | 200 (7.87) | 200 (7.87) | 200 (7.87) | 200 (7.87) | |
| • Height | mm (in) | 472 (18.58) | 472 (18.58) | 472 (18.58) | 472 (18.58) | |
| • Depth | | | | | | |
| - Without operator panel | mm (in) | 237 (9.33) | 237 (9.33) | 237 (9.33) | 237 (9.33) | |
| - With BOP-2/IOP-2 | mm (in) | 248 (9.76) | 248 (9.76) | 248 (9.76) | 248 (9.76) | |
| Frame size | | | FSD | FSD | FSD | FSD |
| Weight, approx. | | | | | | |
| • Without filter | kg (lb) | 17 (37.5) | 17 (37.5) | 18 (39.7) | 18 (39.7) | |
| • With integrated filter class A | kg (lb) | 19 (41.9) | 19 (41.9) | 20 (44.1) | 20 (44.1) | |

¹⁾ The rated output current I_{rated} can be used up to 100 %; however, without overload.

²⁾ The base-load current I_L is based on the duty cycle for low overload (LO).

³⁾ The base-load current I_H is based on the duty cycle for high overload (HO).

⁴⁾ Typical values. More information can be found on the Internet at <https://support.industry.siemens.com/cs/document/94059311>

⁵⁾ The rated input currents are valid for an input voltage of 400 V 3 AC and a line impedance corresponding to $u_K = 1\%$. The rated input current based on I_L is stamped on the inverter rating plate. In the particular application, the input current depends on the motor load and line impedance.

⁶⁾ The maximum motor cable lengths are valid for an input voltage of 400 V 3 AC and operation with a 4 kHz pulse frequency. When an inverter with an integrated line filter class A is used to comply with the limits of EN 61800-3 Category C2 for line-conducted interference emissions, the maximum permissible motor cable length is 150 m (492 ft) (shielded) as standard.

Technical specifications (continued)

| Line voltage 380 ... 480 V 3 AC | | SINAMICS G120C power electronics | | | | | |
|-------------------------------------------------------|-----------------|----------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| | | 6SL3210-1KE31-1.F1 | 6SL3210-1KE31-4.F1 | 6SL3210-1KE31-7.F1 | 6SL3210-1KE32-1.F1 | 6SL3210-1KE32-4.F1 | |
| Output current at 400 V 3 AC | | | | | | | |
| • Rated current $I_{rated}^{1)}$ | A | 103 | 136 | 164 | 201 | 237 | |
| • Base-load current $I_L^{2)}$ | A | 103 | 136 | 164 | 201 | 237 | |
| • Base-load current $I_H^{3)}$ | A | 83 | 103 | 136 | 164 | 201 | |
| • Maximum current I_{max} | A | 165 | 206 | 272 | 328 | 402 | |
| Rated power | | | | | | | |
| • Based on I_L | kW (hp) | 55 (60) | 75 (75) | 90 (100) | 110 (125) | 132 (150) | |
| • Based on I_H | kW | 45 | 55 | 75 | 90 | 110 | |
| Rated pulse frequency | | kHz | 4 | 2 | 2 | 2 | |
| Efficiency η | | % | 98 | 99 | 99 | 99 | |
| Power loss ⁴⁾ at rated current | | kW | 1.476 | 1.474 | 1.885 | 2.245 | 2.803 |
| Cooling air requirement | | m ³ /s (ft ³ /s) | 0.083 (2.93) | 0.153 (5.40) | 0.153 (5.40) | 0.153 (5.40) | 0.153 (5.40) |
| Sound pressure level L_{pA} (1 m) | | dB | 70.6 | 67.7 | 67.7 | 67.7 | 67.7 |
| Rated input current ⁵⁾ | | | | | | | |
| • Based on I_L | A | 96 | 134 | 156 | 187 | 221 | |
| • Based on I_H | A | 85 | 112 | 144 | 169 | 207 | |
| Length of cable to braking resistor, max. | | m (ft) | 10 (32.8) | 10 (32.8) | 10 (32.8) | 10 (32.8) | 10 (32.8) |
| Line supply connection U1/L1, V1/L2, W1/L3 | | | Screw terminals | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 25 ... 70 (6 ... 3/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) |
| Motor connection U2, V2, W2 | | | Screw terminals | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 25 ... 70 (6 ... 3/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) |
| Connection for braking resistor R1, R2 | | | Screw terminals | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 25 ... 70 (6 ... 3/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) | 35 ... 2x120 (1 ... 2x4/0 AWG) |
| PE connection | | | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw | On housing with M4 screw |
| Motor cable length, max. ⁶⁾ | | | | | | | |
| • Without filter, shielded/unshielded | m (ft) | 200/300 (656/984) | 300/450 (984/1476) | 300/450 (984/1476) | 300/450 (984/1476) | 300/450 (984/1476) | 300/450 (984/1476) |
| • With integrated filter class A, shielded/unshielded | m (ft) | 200/300 (656/984) | 300/450 (984/1476) | 300/450 (984/1476) | 300/450 (984/1476) | 300/450 (984/1476) | 300/450 (984/1476) |
| Dimensions | | | | | | | |
| • Width | mm (in) | 275 (10.83) | 305 (12.01) | 305 (12.01) | 305 (12.01) | 305 (12.01) | 305 (12.01) |
| • Height | mm (in) | 551 (21.69) | 708 (27.87) | 708 (27.87) | 708 (27.87) | 708 (27.87) | 708 (27.87) |
| • Depth | | | | | | | |
| - Without operator panel | mm (in) | 237 (9.33) | 357 (14.06) | 357 (14.06) | 357 (14.06) | 357 (14.06) | 357 (14.06) |
| - With BOP-2/IOP-2 | mm (in) | 248 (9.76) | 368 (14.49) | 368 (14.49) | 368 (14.49) | 368 (14.49) | 368 (14.49) |
| Frame size | | | FSE | FSF | FSF | FSF | FSF |
| Weight, approx. | | | | | | | |
| • Without filter | kg (lb) | 27 (59.5) | 59 (130) | 59 (130) | 64 (141) | 64 (141) | 64 (141) |
| • With integrated filter class A | kg (lb) | 29 (63.9) | 62 (137) | 62 (137) | 66 (146) | 66 (146) | 66 (146) |

¹⁾ The rated output current I_{rated} can be used up to 100 %; however, without overload.

²⁾ The base-load current I_L is based on the duty cycle for low overload (LO).

³⁾ The base-load current I_H is based on the duty cycle for high overload (HO).

⁴⁾ Typical values. More information can be found on the Internet at <https://support.industry.siemens.com/cs/document/94059311>

⁵⁾ The rated input currents are valid for an input voltage of 400 V 3 AC and a line impedance corresponding to $u_K = 1\%$. The rated input current based on I_L is stamped on the inverter rating plate. In the particular application, the input current depends on the motor load and line impedance.

⁶⁾ The maximum motor cable lengths are valid for an input voltage of 400 V 3 AC and operation with a 4 kHz pulse frequency. When an inverter with an integrated line filter class A is used to comply with the limits of EN 61800-3 Category C2 for line-conducted interference emissions, the maximum permissible motor cable length is 150 m (492 ft) (shielded) as standard.

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Characteristic curves

Derating data

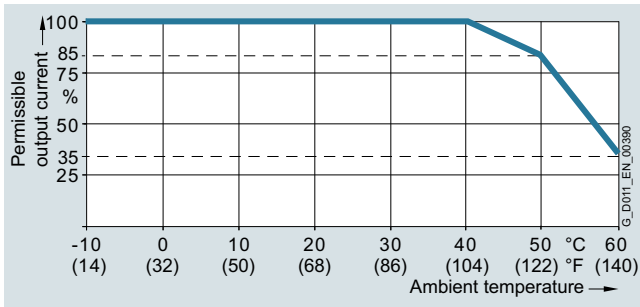
Pulse frequency

| Rated power based on low overload (LO) | | Rated output current in A for a pulse frequency of | | | | | | | |
|----------------------------------------|------|----------------------------------------------------|-------|-------|-------|--------|--------|--------|--------|
| kW | hp | 2 kHz | 4 kHz | 6 kHz | 8 kHz | 10 kHz | 12 kHz | 14 kHz | 16 kHz |
| 0.55 | 0.75 | 1.7 | 1.7 | 1.4 | 1.2 | 1 | 0.9 | 0.8 | 0.7 |
| 0.75 | 1 | 2.2 | 2.2 | 1.9 | 1.5 | 1.3 | 1.1 | 1 | 0.9 |
| 1.1 | 1.5 | 3.1 | 3.1 | 2.6 | 2.2 | 1.9 | 1.6 | 1.4 | 1.2 |
| 1.5 | 2 | 4.1 | 4.1 | 3.5 | 2.9 | 2.5 | 2.1 | 1.8 | 1.6 |
| 2.2 | 3 | 5.6 | 5.6 | 4.8 | 3.9 | 3.4 | 2.8 | 2.5 | 2.2 |
| 3 | 4 | 7.3 | 7.3 | 6.2 | 5.1 | 4.4 | 3.7 | 3.3 | 2.9 |
| 4 | 5 | 8.8 | 8.8 | 7.5 | 6.2 | 5.3 | 4.4 | 4 | 3.5 |
| 5.5 | 7.5 | 12.5 | 12.5 | 10.6 | 8.8 | 7.5 | 6.3 | 5.6 | 5 |
| 7.5 | 10 | 16.5 | 16.5 | 14 | 11.6 | 9.9 | 8.3 | 7.4 | 6.6 |
| 11 | 15 | 25 | 25 | 21.3 | 17.5 | 15 | 12.5 | 11.3 | 10 |
| 15 | 20 | 31 | 31 | 26.4 | 21.7 | 18.6 | 15.5 | 14 | 12.4 |
| 18.5 | 25 | 37 | 37 | 31.5 | 25.9 | 22.2 | 18.5 | 16.7 | 14.8 |
| 22 | 25 | 43 | 43 | 36.6 | 30.1 | 25.8 | 21.5 | 19.4 | 17.2 |
| 30 | 30 | 58 | 58 | 49.3 | 40.6 | 34.8 | 29 | 26.1 | 23.2 |
| 37 | 40 | 68 | 68 | 57.8 | 47.6 | 40.8 | 34 | 30.6 | 27.2 |
| 45 | 50 | 82.5 | 82.5 | 70.1 | 57.8 | 49.5 | 41.3 | 37.1 | 33 |
| 55 | 60 | 103 | 103 | 87.6 | 72.1 | – | – | – | – |
| 75 | 75 | 136 | 136 | 115.6 | 95.2 | – | – | – | – |
| 90 | 100 | 164 | 164 | 139.4 | 114.8 | – | – | – | – |
| 110 | 125 | 201 | 140.7 | – | – | – | – | – | – |
| 132 | 150 | 237 | 165.9 | – | – | – | – | – | – |

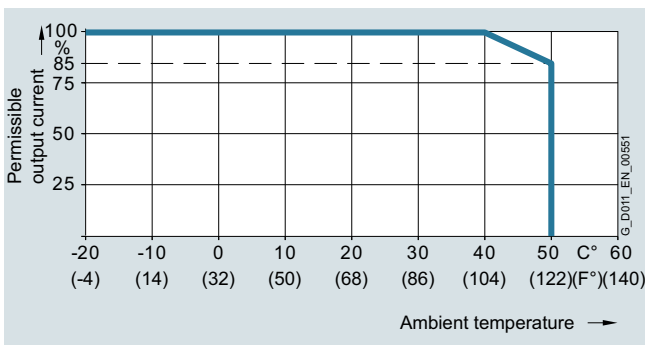
The permissible motor cable length depends on the cable type and the pulse frequency.

Characteristic curves (continued)

Ambient temperature



Permissible output current as a function of the ambient temperature, frame sizes FSAA to FSC



Permissible output current as a function of the ambient temperature, frame sizes FSD to FSF

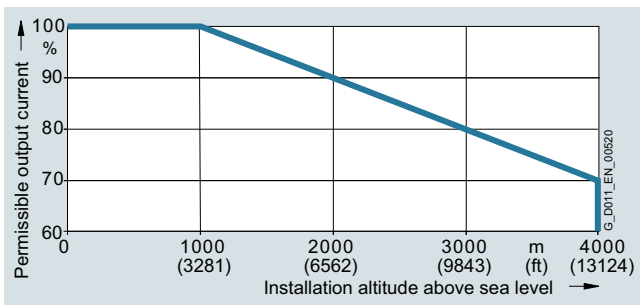
For the frame sizes FSA to FSC, the PROFINET version can be butt-mounted at temperatures up to 55 °C. The frame sizes FSAA and FSD to FSF can be butt-mounted at temperatures up to 50 °C.

Installation altitude

Permissible line supplies as a function of the installation altitude

- Installation altitude up to 2000 m (6562 ft) above sea level
 - Connection to every supply system permitted for the inverter
- Installation altitudes between 2000 m (6562 ft) and 4000 m (13124 ft) above sea level
 - Connection only to a TN system with grounded neutral point
 - TN systems with grounded line conductor are not permitted
 - The TN line system with grounded neutral point can also be supplied using an isolation transformer
 - The phase-to-phase voltage does not have to be reduced

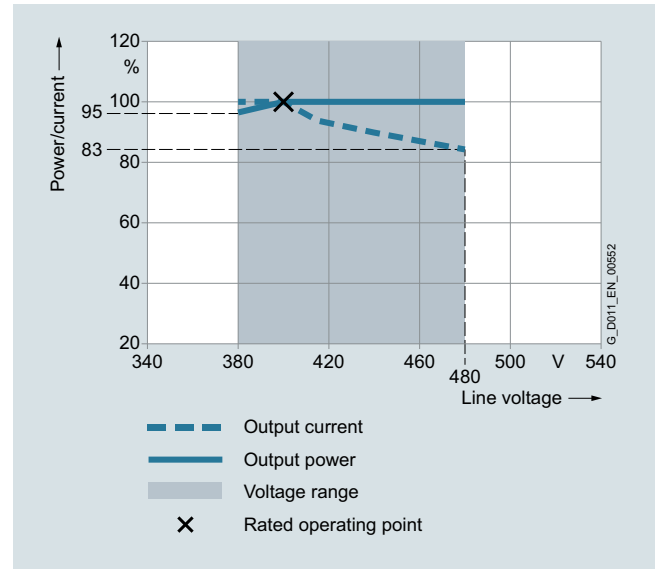
The connected motors, power elements and components must be considered separately.



Permissible output current as a function of the installation altitude, frame sizes FSAA to FSF at 40 °C for low overload (LO)

Current/power derating as a function of the line voltage

The SINAMICS G120C compact inverter supplies a constant power in the line voltage range 380 V to 480 V 3 AC. The constant power results in current derating as a function of the line voltage.



Current derating as a function of the line voltage

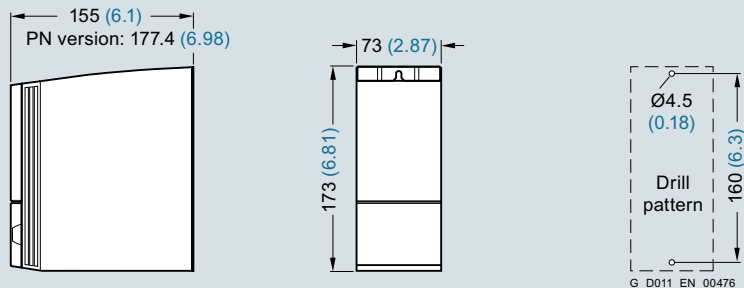
More information on the derating data of the SINAMICS G120C compact inverter can be found in the operating instructions on the Internet at:
www.siemens.com/sinamics-g120c/documentation

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Dimensional drawings



SINAMICS G120C, frame size FSAA

Mounted with 2 M4 bolts, 2 M4 nuts, 2 M4 washers.

When the shield plate is mounted, the drilling pattern is compatible with frame size FSA.

Ventilation clearance required at the top: 80 mm (3.15 inches).

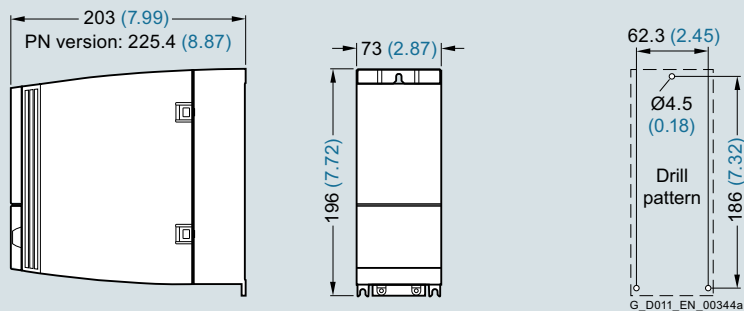
Ventilation clearance required at the bottom: 100 mm (3.94 inches).

Ventilation clearance required at the side: 0 mm (0 inches).

When the BOP-2/IOP-2 is plugged on, the overall depth increases by 11 mm (0.43 inches).

All dimensions in mm (values in brackets are in inches).

1



SINAMICS G120C, frame size FSA

Mounted with 3 M4 bolts, 3 M4 nuts, 3 M4 washers.

Ventilation clearance required at the top: 80 mm (3.15 inches).

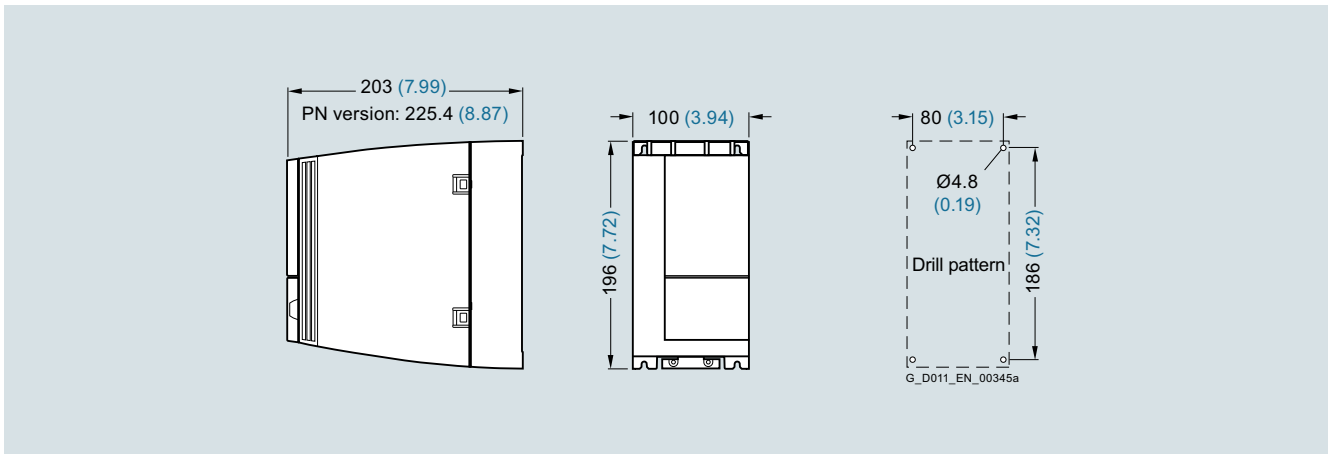
Ventilation clearance required at the bottom: 100 mm (3.94 inches).

Ventilation clearance required at the side: 0 mm (0 inches).

When the BOP-2/IOP-2 is plugged on, the overall depth increases by 11 mm (0.43 inches).

All dimensions in mm (values in brackets are in inches).

Dimensional drawings (continued)



SINAMICS G120C, frame size FSB

Mounted with 4 M4 bolts, 4 M4 nuts, 4 M4 washers.

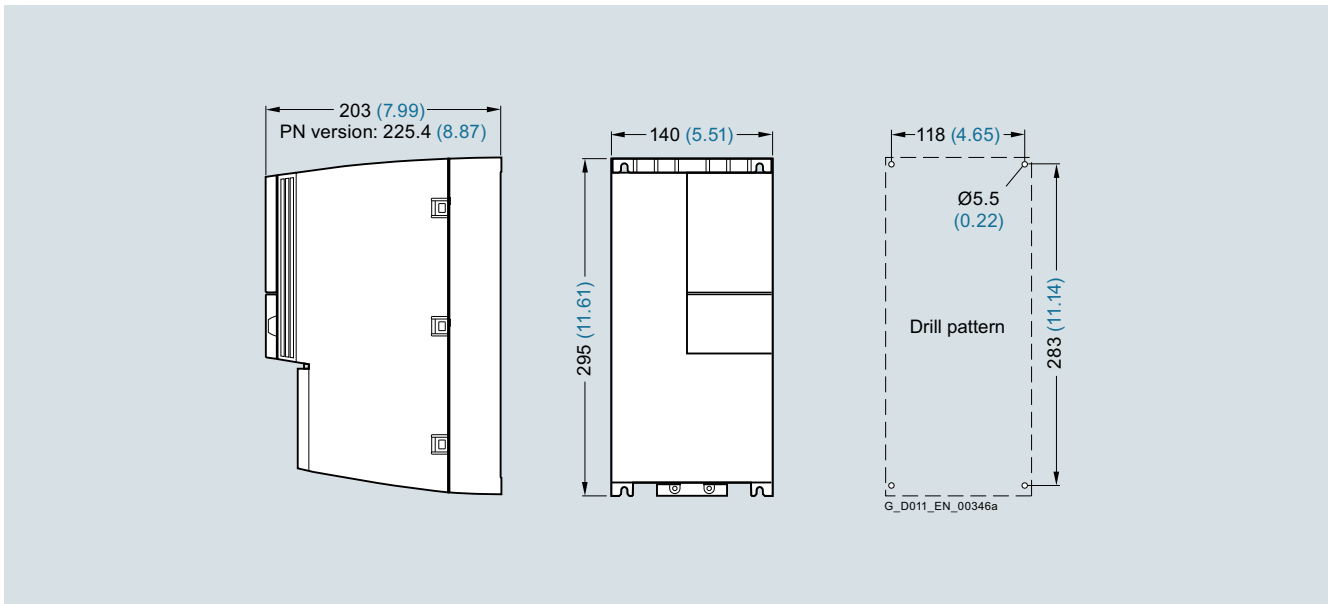
Ventilation clearance required at the top: 80 mm (3.15 inches).

Ventilation clearance required at the bottom: 100 mm (3.94 inches).

Ventilation clearance required at the side: 0 mm (0 inches).

When the BOP-2/IOP-2 is plugged on, the overall depth increases by 11 mm (0.43 inches).

All dimensions in mm (values in brackets are in inches).



SINAMICS G120C, frame size FSC

Mounted with 4 M5 bolts, 4 M5 nuts, 4 M5 washers.

Ventilation clearance required at the top: 80 mm (3.15 inches).

Ventilation clearance required at the bottom: 100 mm (3.94 inches).

Ventilation clearance required at the side: 0 mm (0 inches).

When the BOP-2/IOP-2 is plugged on, the overall depth increases by 11 mm (0.43 inches).

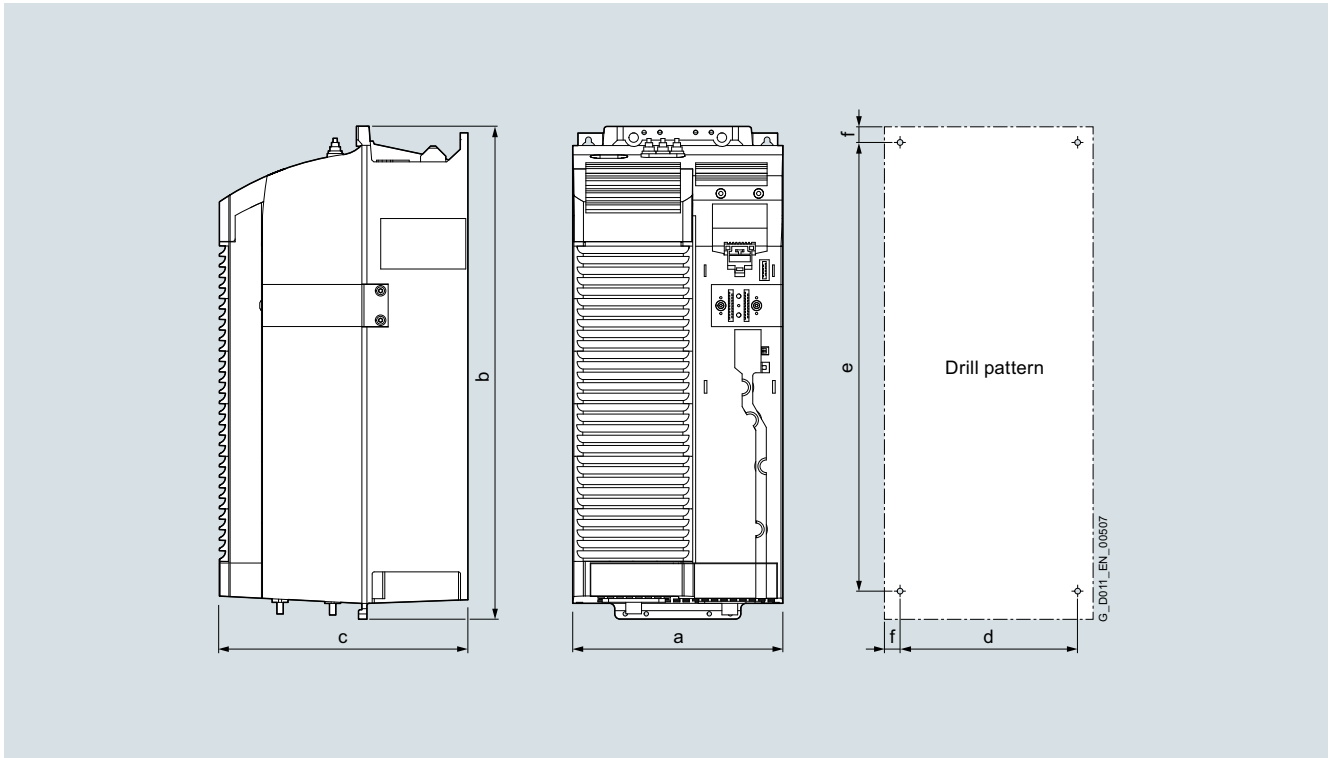
All dimensions in mm (values in brackets are in inches).

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

SINAMICS G120C compact inverters

Dimensional drawings (continued)



SINAMICS G120C frame sizes FSD to FSF

| SINAMICS G120C Frame size | Dimensions in mm (inches) | | | Drilling dimensions in mm (inches) | | | Cooling clearance in mm (inches) | | | Mounting With bolts |
|------------------------------|------------------------------|----------------|----------------|---------------------------------------|----------------|--------------|-------------------------------------|----------------|---------------|------------------------|
| | a (width) | b (height) | c (depth) | d | e | f | top | bottom | front | |
| FSD | 200 (7.87) | 472 (18.58) | 237 (9.33) | 170 (6.69) | 430 (16.93) | 15 (0.59) | 300 (11.81) | 350 (13.78) | 100 (3.94) | 4 x M5 |
| FSE | 275 (10.83) | 551 (21.69) | 237 (9.33) | 230 (9.06) | 509 (20.04) | 11 (0.43) | 300 (11.81) | 350 (13.78) | 100 (3.94) | 4 x M6 |
| FSF | 305 (12.01) | 708 (27.87) | 357 (14.06) | 270 (10.63) | 680 (26.77) | 13 (0.51) | 300 (11.81) | 350 (13.78) | 100 (3.94) | 4 x M8 |

When the BOP-2/IOP-2 is plugged on, the overall depth increases by 11 mm (0.43 inches).

More information

A hard copy of the Compact Operating Instructions is supplied in English and German for SINAMICS G120C. Further documentation, such as Operating Instructions and List Manuals, is available for download free of charge from the Internet at: www.siemens.com/sinamics-g120c/documentation

Detailed information on SINAMICS G120C, the latest technical documentation (brochures, tutorials, dimensional drawings, certificates, manuals and operating instructions) is available on the Internet at: www.siemens.com/sinamics-g120c

In addition, the Drive Technology Configurator (DT Configurator) can be used on the Internet. The DT Configurator can be found in the Siemens Industry Mall at the following address: www.siemens.com/dt-configurator

Furthermore, the SINAMICS SELECTOR app is a practical tool that helps you find article numbers for SINAMICS V20, SINAMICS G120C, SINAMICS G120P and SINAMICS G120 inverters in the output range from 0.12 kW to 630 kW quickly and easily. You will find the free downloads for Android and for iOS at the following link:

www.siemens.com/sinamics-selector

Overview



Line filter for SINAMICS G120C, frame size FSAA

With a line filter, the SINAMICS G120C can achieve a higher radio interference class.

All SINAMICS G120C inverters are available without and with integrated line filter.

For SINAMICS G120C frame sizes FSAA to FSC, external line filters suitable for base mounting are available.

Selection and ordering data

| Rated power | | SINAMICS G120C | | Line filter class B according to EN 55011 |
|-------------|------|------------------|------------|-------------------------------------------|
| kW | hp | Type 6SL3210-... | Frame size | Article No. |
| 0.55 | 0.75 | 1KE11-8U.2 | FSAA | 6SL3203-0BE17-7BA0 |
| 0.75 | 1 | 1KE12-3U.2 | | |
| 1.1 | 1.5 | 1KE13-2U.2 | | |
| 1.5 | 2 | 1KE14-3U.2 | | |
| 2.2 | 3 | 1KE15-8U.2 | FSA | |
| 3 | 4 | 1KE17-5U.1 | | |
| 4 | 5.5 | 1KE18-8U.1 | FSB | 6SL3203-0BE21-8BA0 |
| 5.5 | 7.5 | 1KE21-3U.1 | | |
| 7.5 | 10 | 1KE21-7U.1 | | |
| 11 | 15 | 1KE22-6U.1 | FSC | 6SL3203-0BE23-8BA0 |
| 15 | 20 | 1KE23-2U.1 | | |
| 18.5 | 25 | 1KE23-8U.1 | | |

Technical specifications

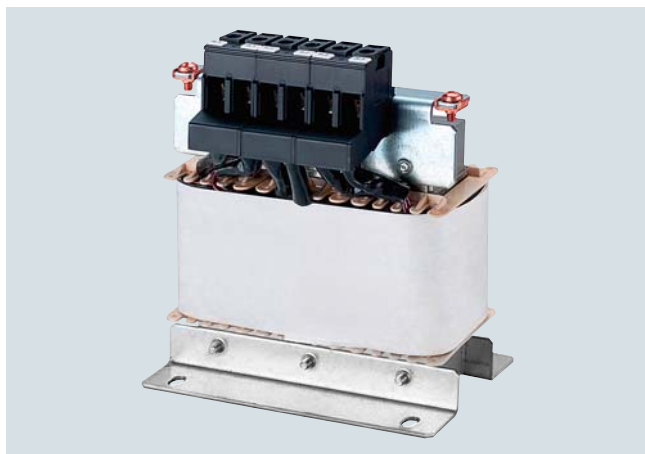
| Line voltage 380 ... 480 V 3 AC | | Line filter class B | | |
|---------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------|
| | | 6SL3203-0BE17-7BA0 | 6SL3203-0BE21-8BA0 | 6SL3203-0BE23-8BA0 |
| Rated current | A | 11.4 | 23.5 | 49.4 |
| Pulse frequency | kHz | 4 ... 16 | 4 ... 16 | 4 ... 16 |
| Line supply connection L1, L2, L3 | | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 1 ... 2.5 | 2.5 ... 6 | 6 ... 16 |
| Load connection U, V, W | | Shielded cable | Shielded cable | Shielded cable |
| • Cable cross-section | mm ² | 1.5 | 4 | 10 |
| • Length | m (ft) | 0.45 (1.48) | 0.5 (1.64) | 0.54 (1.77) |
| PE connection | | On housing via M5 screw stud | On housing via M5 screw stud | On housing via M6 screw studs |
| • Conductor cross-section | mm ² | 1 ... 2.5 | 2.5 ... 6 | 6 ... 16 |
| Degree of protection | | IP20 | IP20 | IP20 |
| Dimensions | | | | |
| • Width | mm (in) | 73 (2.87) | 100 (3.94) | 140 (5.51) |
| • Height | mm (in) | 202 (7.95) | 297 (11.69) | 359 (14.13) |
| • Depth | mm (in) | 65 (2.56) | 85 (3.35) | 95 (3.74) |
| Possible as base component | | Yes | Yes | Yes |
| Weight, approx. | kg (lb) | 1.75 (3.86) | 4 (8.82) | 7.3 (16.1) |
| Suitable for SINAMICS G120C | | FSAA 6SL3210-1KE11-8U.2 6SL3210-1KE12-3U.2 6SL3210-1KE13-2U.2 6SL3210-1KE14-2U.2 6SL3210-1KE15-8U.2 FSA 6SL3210-1KE17-5U.1 6SL3210-1KE18-8U.1 | 6SL3210-1KE21-3U.1 6SL3210-1KE21-7U.1 | 6SL3210-1KE22-6U.1 6SL3210-1KE23-2U.1 6SL3210-1KE23-8U.1 |
| • Frame size | | FSAA/FSA | FSB | FSC |

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Line-side components > Line reactors

Overview



Line reactor for SINAMICS G120C frame size FSB

Line reactors smooth the current drawn by the inverter and thus reduce harmonic components in the line current. Through the reduction of the current harmonics, the thermal load on the power components in the rectifier and in the DC link capacitors is reduced as well as the harmonic effects on the supply. The use of a line reactor increases the service life of the inverter.

If the ratio of the rated inverter power to the line supply short-circuit power is less than 1 %, then it is recommended to use a line reactor to reduce the current peaks.

A DC link reactor is integrated in the SINAMICS G120C compact inverter frame sizes FSD to FSF and therefore no line reactor is required.

Selection and ordering data

| Rated power | | SINAMICS G120C | | Line reactor |
|----------------------------------------|------|------------------|------------|---------------------------|
| kW | hp | Type 6SL3210-... | Frame size | Article No. |
| Line voltage 380 ... 480 V 3 AC | | | | |
| 0.55 | 0.75 | 1KE11-8..2 | FSA | 6SL3203-0CE13-2AA0 |
| 0.75 | 1 | 1KE12-3..2 | | |
| 1.1 | 1.5 | 1KE13-2..2 | | |
| 1.5 | 2 | 1KE14-3..2 | FSA | 6SL3203-0CE21-0AA0 |
| 2.2 | 3 | 1KE15-8..2 | | |
| 3 | 4 | 1KE17-5..1 | FSA | |
| 4 | 5 | 1KE18-8..1 | | 6SL3203-0CE21-8AA0 |
| 5.5 | 7.5 | 1KE21-3..1 | FSB | |
| 7.5 | 10 | 1KE21-7..1 | | |
| 11 | 15 | 1KE22-6..1 | FSC | 6SL3203-0CE23-8AA0 |
| 15 | 20 | 1KE23-2..1 | | |
| 18.5 | 25 | 1KE23-8..1 | | |

Line reactors that are suitable for base mounting are also available for SINAMICS G120C, frame size FSA, 0.55 kW to 2.2 kW.

- 0.55 kW: 6SE6400-3CC00-2AD3
- 0.75 kW to 1.1 kW: 6SE6400-3CC00-4AD3
- 1.5 kW to 2.2 kW: 6SE6400-3CC00-6AD3

For 2.2 kW, operation of the line reactors that are suitable for base mounting is only permitted for operating the inverter with rated power of 1.5 kW based on high overload (HO).

Additional information is available in the operating instructions on the Internet at:

www.siemens.com/sinamics-g120c/documentation

Technical specifications

| Line voltage 380 ... 480 V 3 AC | | Line reactor | | | |
|----------------------------------------------------------------------|-----------------|----------------------------------------------------------------|-------------------------------------------------|------------------------------------------|----------------------------------------------------------------|
| | | 6SL3203-0CE13-2AA0 | 6SL3203-0CE21-0AA0 | 6SL3203-0CE21-8AA0 | 6SL3203-0CE23-8AA0 |
| Rated current | A | 4 | 11.3 | 22.3 | 47 |
| Power loss at 50/60 Hz | W | 23/26 | 36/40 | 53/59 | 88/97 |
| Line supply/load connection 1L1, 1L2, 1L3 2L1, 2L2, 2L3 | | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 4 | 4 | 10 | 16 |
| PE connection | | M4 × 8; U washer; spring lock washer | M4 × 8; U washer; spring lock washer | M5 × 10; U washer; spring lock washer | M5 × 10; U washer; spring lock washer |
| Degree of protection | | IP20 | IP20 | IP20 | IP20 |
| Dimensions | | | | | |
| • Width | mm (in) | 125 (4.92) | 125 (4.92) | 125 (4.92) | 190 (7.48) |
| • Height | mm (in) | 120 (4.72) | 140 (5.51) | 145 (5.71) | 220 (8.66) |
| • Depth | mm (in) | 71 (2.80) | 71 (2.80) | 91 (3.58) | 91 (3.58) |
| Weight, approx. | kg (lb) | 1.1 (2.4) | 2.1 (4.6) | 2.95 (6.5) | 7.8 (17.2) |
| Suitable for SINAMICS G120C | Type | 6SL3210-1KE11-8..2 6SL3210-1KE12-3..2 6SL3210-1KE13-2..2 | FSA 6SL3210-1KE14-3..2 6SL3210-1KE15-8..2 | 6SL3210-1KE21-3..1 6SL3210-1KE21-7..1 | 6SL3210-1KE22-6..1 6SL3210-1KE23-2..1 6SL3210-1KE23-8..1 |
| • Frame size | | FSA | FSA/FSA | FSB | FSC |

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Selection and ordering data

Overcurrent protection devices are absolutely necessary for the operation of the inverters. The following table lists recommendations for fuses.

- Siemens fuses of type 3NA3 for use in the area of validity of IEC
- UL-listed fuses Class J for use in USA and Canada

Recommendations on further overcurrent protection devices are available at:

<https://support.industry.siemens.com/cs/document/109750343>

The Short Circuit Current Rating (SCCR) according to UL for industrial control panel installations to NEC Article 409 or UL 508A/508C or UL 61800-5-1 is as follows for Class J fuses for

- SINAMICS G120C: 100 kA

SCCR and ICC values for combination with further overcurrent protection devices are available at:

<https://support.industry.siemens.com/cs/document/109750343>

Notes for installations in Canada:

The inverters are intended for line supply systems with overvoltage category III. More information is available in the technical documentation on the Internet at:

www.siemens.com/sinamics-g120c/documentation

More information about the listed Siemens fuses is available in Catalog LV 10 as well as in the Industry Mall.

| Rated power | | SINAMICS G120C | | IEC-compliant | | UL/cUL-compliant | |
|----------------------------------------|------|------------------|------------|---------------|---------------------|-------------------------------------|--------------|
| kW | hp | Type 6SL3210-... | Frame size | Fuse | | Fuse type Rated voltage 600 V AC | |
| | | | | Current A | 3NA3 Article No. | Class | Current A |
| Line voltage 380 ... 480 V 3 AC | | | | | | | |
| 0.55 | 0.75 | 1KE11-8..2 | FSA | 10 | 3NA3803 | J | 10 |
| 0.75 | 1 | 1KE12-3..2 | | | | | |
| 1.1 | 1.5 | 1KE13-2..2 | | | | | |
| 1.5 | 2 | 1KE14-3..2 | | | | | |
| 2.2 | 3 | 1KE15-8..2 | | | | | |
| 3 | 4 | 1KE17-5..1 | FSA | 16 | 3NA3805 | J | 15 |
| 4 | 5 | 1KE18-8..1 | | | | | |
| 5.5 | 7.5 | 1KE21-3..1 | FSB | 32 | 3NA3812 | J | 35 |
| 7.5 | 10 | 1KE21-7..1 | | | | | |
| 11 | 15 | 1KE22-6..1 | FSC | 63 | 3NA3822 | J | 60 |
| 15 | 20 | 1KE23-2..1 | | | | | |
| 18.5 | 25 | 1KE23-8..1 | | | | | |
| 22 | 30 | 1KE24-4.F1 | FSD | 80 | 3NA3824 | J | 70 |
| 30 | 40 | 1KE26-0.F1 | FSD | 100 | 3NA3830 | J | 90 |
| 37 | 50 | 1KE27-0.F1 | | | | J | 100 |
| 45 | 60 | 1KE28-4.F1 | FSD | 125 | 3NA3832 | J | 125 |
| 55 | 75 | 1KE31-1.F1 | FSE | 160 | 3NA3836 | J | 150 |
| 75 | 100 | 1KE31-4.F1 | FSF | 200 | 3NA3140 | J | 200 |
| 90 | 125 | 1KE31-7.F1 | FSF | 224 | 3NA3142 | J | 250 |
| 110 | 150 | 1KE32-1.F1 | FSF | 300 | 3NA3250 | J | 300 |
| 132 | 200 | 1KE32-4.F1 | FSF | 315 | 3NA3252 | J | 350 |

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

DC link components > Braking resistors

Overview



Braking resistor for SINAMICS G120C, frame size FSB

The excess energy of the DC link is dissipated using the braking resistor. The braking resistors are designed for use with the SINAMICS G120C. SINAMICS G120C has an integrated brake chopper and cannot feed back regenerative energy to the line supply. For regenerative operation, e.g. the braking of a rotating mass with high moment of inertia, a braking resistor must be connected to convert the resulting energy into heat.

The braking resistors are designed for mounting horizontally or vertically onto a heat-resistant sheet steel panel. The resistors should be mounted such as to ensure that the air can flow in and out and heat cannot build up. The heat dissipated by the braking resistor must not diminish the inverter cooling.

Every braking resistor is equipped with a temperature switch. The temperature switch can be evaluated to prevent consequential damage if the braking resistor overheats.

Note:

For the electromagnetically compatible connection of an optionally connectable braking resistor, the corresponding shield connection kit is to be ordered for frame sizes FSD to FSF. For more information, see [Shield connection kits in the section Supplementary system components](#).

Selection and ordering data

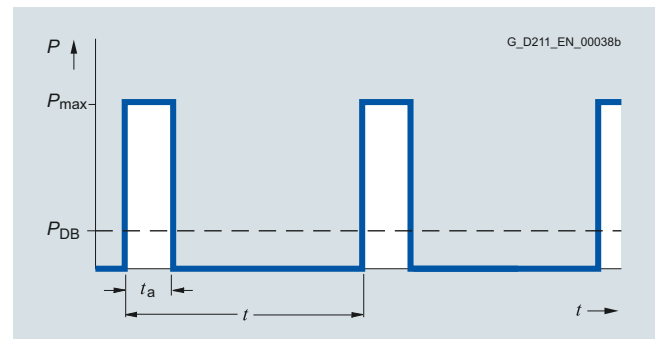
| Rated power | | SINAMICS G120C | | Braking resistor | |
|----------------------------------------|------|------------------|------------|---------------------------|--|
| kW | hp | Type 6SL3210-... | Frame size | Article No. | |
| Line voltage 380 ... 480 V 3 AC | | | | | |
| 0.55 | 0.75 | 1KE11-8..2 | FSA | 6SL3201-0BE14-3AA0 | |
| 0.75 | 1 | 1KE12-3..2 | | | |
| 1.1 | 1.5 | 1KE13-2..2 | | | |
| 1.5 | 2 | 1KE14-3..2 | | | |
| 2.2 | 3 | 1KE15-8..2 | FSA | 6SL3201-0BE21-0AA0 | |
| 3 | 4 | 1KE17-5..1 | FSA | | |
| 4 | 5 | 1KE18-8..1 | | | |
| 5.5 | 7.5 | 1KE21-3..1 | FSB | 6SL3201-0BE21-8AA0 | |
| 7.5 | 10 | 1KE21-7..1 | | | |
| 11 | 15 | 1KE22-6..1 | FSC | 6SL3201-0BE23-8AA0 | |
| 15 | 20 | 1KE23-2..1 | | | |
| 18.5 | 25 | 1KE23-8..1 | | | |
| 22 | 30 | 1KE24-4.F1 | FSD | JJY:023422620001 | |
| 30 | 40 | 1KE26-0.F1 | FSD | JJY:023424020001 | |
| 37 | 50 | 1KE27-0.F1 | | | |
| 45 | 60 | 1KE28-4.F1 | FSD | JJY:023434020001 | |
| 55 | 75 | 1KE31-1.F1 | FSE | JJY:023434020001 | |
| 75 | 100 | 1KE31-4.F1 | FSF | JJY:023454020001 | |
| 90 | 125 | 1KE31-7.F1 | | | |
| 110 | 150 | 1KE32-1.F1 | FSF | JJY:023464020001 | |
| 132 | 200 | 1KE32-4.F1 | | | |

A braking resistor 6SE6400-4BD11-0AA0 that is suitable for base mounting is also available for SINAMICS G120C, frame size FSA, 0.55 kW to 2.2 kW. For 2.2 kW, operation of the braking resistor that is suitable for base mounting is only permitted for operating the inverter with rated power of 1.5 kW based on high overload (HO).

Additional information is available in the operating instructions on the Internet at:

www.siemens.com/sinamics-g120c/documentation

Characteristic curves



Load diagram for the braking resistors

$t_a = 12 \text{ s}$
 $t = 240 \text{ s}$

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Technical specifications

| Line voltage 380 ... 480 V 3 AC | | Braking resistor | | | |
|---------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------|
| | | 6SL3201-0BE14-3AA0 | 6SL3201-0BE21-0AA0 | 6SL3201-0BE21-8AA0 | 6SL3201-0BE23-8AA0 |
| Resistance | Ω | 370 | 140 | 75 | 30 |
| Rated power P_{DB} (Continuous braking power) | kW | 0.075 | 0.2 | 0.375 | 0.925 |
| Peak power P_{max} (load duration $t_a = 12$ s with period $t = 240$ s) | kW | 1.5 | 4 | 7.5 | 18.5 |
| Power connection | | Terminal block | Terminal block | Terminal block | Terminal block |
| • Conductor cross-section | mm ² | 2.5 | 2.5 | 2.5 | 6 |
| Thermostatic switch | | NC contact | NC contact | NC contact | NC contact |
| • Contact load, max. | | 250 V AC/2.5 A | 250 V AC/2.5 A | 250 V AC/2.5 A | 250 V AC/2.5 A |
| • Conductor cross-section | mm ² | 2.5 | 2.5 | 2.5 | 2.5 |
| PE connection | | | | | |
| • Via terminal block | | Yes | Yes | Yes | Yes |
| • PE connection on housing | | M4 screw | M4 screw | M4 screw | M4 screw |
| Degree of protection | | IP20 | IP20 | IP20 | IP20 |
| Dimensions | | | | | |
| • Width | mm (in) | 105 (4.13) | 105 (4.13) | 175 (6.89) | 250 (9.84) |
| • Height | mm (in) | 295 (11.61) | 345 (13.58) | 345 (13.58) | 490 (19.29) |
| • Depth | mm (in) | 100 (3.94) | 100 (3.94) | 100 (3.94) | 140 (5.51) |
| Weight, approx. | kg (lb) | 1.48 (3.26) | 1.8 (3.97) | 2.73 (6.02) | 6.2 (13.7) |
| Suitable for SINAMICS G120C | Type | 6SL3210-1KE11-8..2 6SL3210-1KE12-3..2 6SL3210-1KE13-2..2 6SL3210-1KE14-3..2 | FSA 6SL3210-1KE15-8..2 FSA 6SL3210-1KE17-5..1 6SL3210-1KE18-8..1 | 6SL3210-1KE21-3..1 6SL3210-1KE21-7..1 | 6SL3210-1KE22-6..1 6SL3210-1KE23-2..1 6SL3210-1KE23-8..1 |
| • Frame size | | FSA | FSA/FSA | FSB | FSC |

| Line voltage 380 ... 480 V 3 AC | | Braking resistor | | | | |
|---------------------------------------------------------------------------------------------------|---------|--------------------|------------------------------------------|--------------------------------------------------------|------------------------------------------|------------------------------------------|
| | | JJY:023422620001 | JJY:023424020001 | JJY:023434020001 | JJY:023454020001 ¹⁾ | JJY:023464020001 ²⁾ |
| Resistance | Ω | 25 | 15 | 10 | 7.1 | 5 |
| Rated power P_{DB} (Continuous braking power) | kW | 1.1 | 1.85 | 2.75 | 3.85 | 5.5 |
| Peak power P_{max} (load duration $t_a = 12$ s with period $t = 240$ s) | kW | 22 | 37 | 55 | 77 | 110 |
| Power connection | | Cable | Cable | Cable | Cable | Cable |
| Thermostatic switch | | Integrated | Integrated | Integrated | Integrated | Integrated |
| Degree of protection | | IP21 | IP21 | IP21 | IP21 | IP21 |
| Dimensions | | | | | | |
| • Width | mm (in) | 220 (8.66) | 220 (8.66) | 350 (13.78) | 1) | 2) |
| • Height | mm (in) | 470 (18.50) | 610 (24.02) | 630 (24.80) | 1) | 2) |
| • Depth | mm (in) | 180 (7.09) | 180 (7.09) | 180 (7.09) | 1) | 2) |
| Weight, approx. | kg (lb) | 7 (15.4) | 9.5 (20.9) | 13.5 (29.8) | 20.5 (45.2) | 27 (59.5) |
| Suitable for SINAMICS G120C | Type | 6SL3210-1KE24-4.F1 | 6SL3210-1KE26-0.F1 6SL3210-1KE27-0.F1 | FSD 6SL3210-1KE28-4.F1 FSE 6SL3210-1KE31-1.F1 | 6SL3210-1KE31-4.F1 6SL3210-1KE31-7.F1 | 6SL3210-1KE32-1.F1 6SL3210-1KE32-4.F1 |
| • Frame size | | FSD | FSD | FSD/FSE | FSF | FSF |

¹⁾ This braking resistor consists of the two braking resistors, JJY:023422620001 and JJY:023434020001, which must be connected in parallel on the plant/system side.

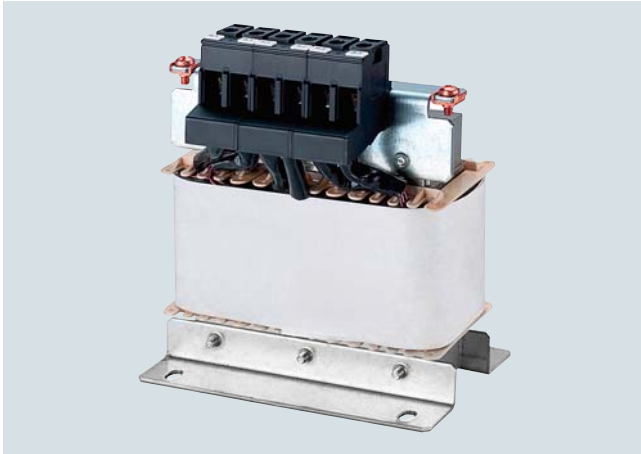
²⁾ This braking resistor consists of two JJY:023434020001 braking resistors, which must be connected in parallel on the plant/system side.

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Load-side power components > Output reactors

Overview



Output reactor for SINAMICS G120C, frame size FSA

Output reactors reduce the rate of voltage rise (dv/dt) and the height of the current peaks, and enable longer motor cables to be connected.

Owing to the high rates of voltage rise of the fast-switching IGBTs, the capacitance of long motor cables reverses polarity very quickly with every switching operation in the inverter. As a result, the inverter is loaded with additional current peaks of substantial magnitude.

Output reactors reduce the magnitude of these additional peaks because the cable capacitance reverses polarity more slowly across the reactor inductance, thereby attenuating the amplitudes of the current peaks.

When using output reactors, the following should be observed:

- Max. permissible output frequency 150 Hz
- Max. permissible pulse frequency 4 kHz
- The output reactor must be installed as close as possible to the inverter

Selection and ordering data

| Rated power | | SINAMICS G120C | | Output reactor |
|---------------------------|------|------------------|------------|---------------------------|
| kW | hp | Type 6SL3210-... | Frame size | Article No. |
| 380 ... 480 V 3 AC | | | | |
| 0.55 | 0.75 | 1KE11-8..2 | FSA | 6SL3202-0AE16-1CA0 |
| 0.75 | 1 | 1KE12-3..2 | | |
| 1.1 | 1.5 | 1KE13-2..2 | | |
| 1.5 | 2 | 1KE14-3..2 | | |
| 2.2 | 3 | 1KE15-8..2 | | |
| 3 | 4 | 1KE17-5..1 | FSA | 6SL3202-0AE18-8CA0 |
| 4 | 5 | 1KE18-8..1 | | |
| 5.5 | 7.5 | 1KE21-3..1 | FSB | 6SL3202-0AE21-8CA0 |
| 7.5 | 10 | 1KE21-7..1 | | |
| 11 | 15 | 1KE22-6..1 | FSC | 6SL3202-0AE23-8CA0 |
| 15 | 20 | 1KE23-2..1 | | |
| 18.5 | 25 | 1KE23-8..1 | | |
| 22 | 30 | 1KE24-4.F1 | FSD | 6SE6400-3TC07-5ED0 |
| 30 | 40 | 1KE26-0.F1 | | |
| 37 | 50 | 1KE27-0.F1 | | |
| 45 | 60 | 1KE28-4.F1 | FSD | 6SE6400-3TC14-5FD0 |
| 55 | 75 | 1KE31-1.F1 | FSE | 6SE6400-3TC14-5FD0 |
| 75 | 100 | 1KE31-4.F1 | FSF | 6SE6400-3TC14-5FD0 |
| 90 | 125 | 1KE31-7.F1 | | |
| 110 | 150 | 1KE32-1.F1 | FSF | 6SL3000-2BE32-1AA0 |
| 132 | 200 | 1KE32-4.F1 | FSF | 6SL3000-2BE32-6AA0 |

An output reactor 6SE6400-3TC00-4AD2 that is suitable for base mounting is also available for SINAMICS G120C, frame size FSA, 0.55 kW to 2.2 kW. For 2.2 kW, operation of the output reactor that is suitable for base mounting is only permitted for operating the inverter with rated power of 1.5 kW based on high overload (HO).

Additional information is available in the operating instructions on the Internet at:

www.siemens.com/sinamics-g120c/documentation

Technical specifications

| Line voltage 380 ... 480 V 3 AC | | Output reactor | | | |
|---------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------------------------------|
| | | 6SL3202-0AE16-1CA0 | 6SL3202-0AE18-8CA0 | 6SL3202-0AE21-8CA0 | 6SL3202-0AE23-8CA0 |
| Rated current | A | 6.1 | 9 | 18.5 | 39 |
| Power loss | kW | 0.09 | 0.08 | 0.08 | 0.11 |
| Connection to the Power Module/ motor connection | | Screw terminals | Screw terminals | Screw terminals | Screw terminals |
| • Conductor cross-section | mm ² | 4 | 4 | 10 | 16 |
| PE connection | | M4 screw stud | M4 screw stud | M5 screw stud | M5 screw stud |
| Cable length, max. between output reactor and motor | | | | | |
| • 380 V -10 % ... 415 V +10 % 3 AC | | | | | |
| - Shielded | m (ft) | 150 (492) | 150 (492) | 150 (492) | 150 (492) |
| - Unshielded | m (ft) | 225 (738) | 225 (738) | 225 (738) | 225 (738) |
| • 440 ... 480 V 3 AC +10 % | | | | | |
| - Shielded | m (ft) | 100 (328) | 100 (328) | 100 (328) | 100 (328) |
| - Unshielded | m (ft) | 150 (492) | 150 (492) | 150 (492) | 150 (492) |
| Dimensions | | | | | |
| • Width | mm (in) | 207 (8.15) | 207 (8.15) | 247 (9.72) | 257 (10.12) |
| • Height | mm (in) | 175 (6.89) | 180 (7.09) | 215 (8.46) | 235 (9.25) |
| • Depth | mm (in) | 72.5 (2.85) | 72.5 (2.85) | 100 (3.94) | 114.7 (4.52) |
| Possible as base component | | No | No | No | No |
| Degree of protection | | IP20 | IP20 | IP20 | IP20 |
| Weight, approx. | kg (lb) | 3.4 (7.50) | 3.9 (8.60) | 10.1 (22.3) | 11.2 (24.7) |
| Suitable for SINAMICS G120C | Type | 6SL3210-1KE11-8..2 6SL3210-1KE12-3..2 6SL3210-1KE13-2..2 6SL3210-1KE14-3..2 6SL3210-1KE15-8..2 | 6SL3210-1KE17-5..1 6SL3210-1KE18-8..1 | 6SL3210-1KE21-3..1 6SL3210-1KE21-7..1 | 6SL3210-1KE22-6..1 6SL3210-1KE23-2..1 6SL3210-1KE23-8..1 |
| • Frame size | | FSAA | FSA | FSB | FSC |

| Line voltage 380 ... 480 V 3 AC | | Output reactor | | | |
|---------------------------------------------------------------|---------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| | | 6SE6400-3TC07-5ED0 | 6SE6400-3TC14-5FD0 | 6SL3000-2BE32-1AA0 | 6SL3000-2BE32-6AA0 |
| Rated current | A | 90 ¹⁾ | 178 ¹⁾ | 210 | 260 |
| Power loss | kW | 0.27 | 0.47 | 0.49 | 0.5 |
| Connection to the Power Module/ motor connection | | Flat connector for M6 cable lug | Flat connector for M8 cable lug | Flat connector for M10 cable lug | Flat connector for M10 cable lug |
| PE connection | | M6 screw | M8 screw | M8 screw | M8 screw |
| Cable length, max. between output reactor and motor | | | | | |
| • 380 V -10 % ... 415 V +10 % 3 AC | | | | | |
| - Shielded | m (ft) | 200 (656) | 200 (656) | 300 (984) | 300 (984) |
| - Unshielded | m (ft) | 300 (984) | 300 (984) | 450 (1476) | 450 (1476) |
| • 440 ... 480 V 3 AC +10 % | | | | | |
| - Shielded | m (ft) | 200 (656) | 200 (656) | 300 (984) | 300 (984) |
| - Unshielded | m (ft) | 300 (984) | 300 (984) | 450 (1476) | 450 (1476) |
| Dimensions | | | | | |
| • Width | mm (in) | 270 (10.63) | 350 (13.78) | 300 (11.81) | 300 (11.81) |
| • Height | mm (in) | 248 (9.76) | 321 (12.64) | 285 (11.22) | 315 (12.40) |
| • Depth | mm (in) | 209 (8.23) | 288 (11.34) | 257 (10.12) | 277 (10.91) |
| Possible as base component | | No | No | No | No |
| Degree of protection | | IP00 | IP00 | IP00 | IP00 |
| Weight, approx. | kg (lb) | 27 (59.5) | 57 (126) | 60 (132) | 66 (146) |
| Suitable for SINAMICS G120C | Type | 6SL3210-1KE24-4.F1 6SL3210-1KE26-0.F1 6SL3210-1KE27-0.F1 | FSD 6SL3210-1KE28-4.F1 FSE 6SL3210-1KE31-1.F1 FSF 6SL3210-1KE31-4.F1 6SL3210-1KE31-7.F1 | 6SL3210-1KE32-1.F1 | 6SL3210-1KE32-4.F1 |
| • Frame size | | FSD | FSD/FSE/FSF | FSF | FSF |

¹⁾ On the rating plate of the reactor, the current is specified according to the duty cycle for high overload (HO). This is lower than the current specified according to the duty cycle for low overload (LO) of the SINAMICS G120C inverter.

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Load-side power components > Sine-wave filters

Overview



Sine-wave filter (example)

Sine-wave filters limit the rate of voltage rise (dv/dt) and the peak voltages on the motor winding. Similar to an output reactor, they enable the connection of longer motor cables.

A sine-wave filter, suitable for base mounting, is available for SINAMICS G120C, frame size FSAA, 0.55 kW to 2.2 kW.

For 2.2 kW, operation of the sine-wave filter that is suitable for base mounting is only permitted for operating the inverter with rated power of 1.5 kW based on high overload (HO).

For technical specifications, see the datasheet on the Internet: <https://support.industry.siemens.com/cs/document/24479847>

Additional information is available in the Operating Instructions on the Internet at: www.siemens.com/sinamics-g120c/documentation

Selection and ordering data

| Rated power | | SINAMICS G120C | | Sine-wave filter (base mounting possible) | |
|---------------------------|------|------------------|------------|-------------------------------------------|--|
| kW | hp | Type 6SL3210-... | Frame size | Article No. | |
| 380 ... 480 V 3 AC | | | | | |
| 0.55 | 0.75 | 1KE11-8U . 2 | FSAA | 6SE6400-3TD00-4AD0 | |
| 0.75 | 1 | 1KE12-3U . 2 | | | |
| 1.1 | 1.5 | 1KE13-2U . 2 | | | |
| 1.5 | 2 | 1KE14-3U . 2 | | | |

Overview

| Operator panel | IOP-2 and IOP-2 Handheld Intelligent Operator Panel | BOP-2 Basic Operator Panel |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description |  |  |
| | <p>Thanks to the high-contrast color display, menu-based operation and the wizards, commissioning of the standard drives is easy. Application wizards guide the user through the commissioning of important applications such as pumps, fans, compressors, or conveyor systems.</p> | <p>Commissioning of standard drives is easy with the menu-prompted dialog on a 2-line display. Simultaneous display of the parameter and parameter value, as well as parameter filtering, means that basic commissioning of a drive can be performed easily and, in most cases, without a printed parameter list.</p> |
| Possible applications | <ul style="list-style-type: none"> • Can be mounted directly on the inverter • Can be mounted in a control cabinet door using a door mounting kit (achievable degree of protection is IP55/UL Type 12 enclosure) • Available as handheld version • The following languages are integrated in the IOP-2: English, German, French, Italian, Spanish, Portuguese, Dutch, Swedish, Finnish, Russian, Czech, Polish, Turkish, Chinese Simplified | <ul style="list-style-type: none"> • Can be mounted directly on the inverter • Can be mounted in the control cabinet door using a door mounting kit (achievable degree of protection is IP55/UL Type 12) |
| Quick commissioning without expert knowledge | <ul style="list-style-type: none"> • Standard commissioning using the clone function • For quicker access, the parameter block names can be directly entered respectively changed on the IOP-2 using the virtual keyboard. • User-defined parameter list with a reduced number of self-selected parameters • Simple commissioning of standard applications using application-specific wizards; it is not necessary to know the parameter structure • Simple local commissioning using the handheld version • Commissioning is possible largely without documentation | <ul style="list-style-type: none"> • Standard commissioning using the clone function |
| High degree of operator friendliness and intuitive operation | <ul style="list-style-type: none"> • Intuitive navigation by operating with a sensor control field • Graphic color display to show status values such as pressure or flow rate in the form of scalar values, bar-type diagrams, or trend displays • Status display with freely selectable units to specify physical values • Direct manual operation of the drive – you can simply toggle between the automatic and manual modes • Simple cloning of specific settings of the IOP-2 user interface. | <ul style="list-style-type: none"> • 2-line display for showing up to 2 process values with text • Status display of predefined units • Direct manual operation of the drive – you can simply toggle between the automatic and manual modes |
| Minimization of maintenance times | <ul style="list-style-type: none"> • Diagnostics using plain text display, can be used locally on-site without documentation • The support function is used to determine the drive data for the Power Module, Control Unit and IOP-2 and makes this available as a two-dimensional code (data matrix/QR code) • Easily upgradable to new functional status via USB interface | <ul style="list-style-type: none"> • Diagnostics with menu prompting with 7-segment display |

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Supplementary system components > IOP-2 Intelligent Operator Panel

Overview

IOP-2 Intelligent Operator Panel



IOP-2 Intelligent Operator Panel

The Intelligent Operator Panel IOP-2 is a very user-friendly and powerful operator panel for the SINAMICS G120, SINAMICS G120C, SINAMICS G120P, SINAMICS G110D, SINAMICS G120D, SINAMICS G110M and SIMATIC ET 200pro FC-2.

The IOP-2 supports both newcomers and drive experts. Thanks to the membrane keyboard with a central sensor control field, high-contrast color displays, menu-based operation and application wizards, it is easy to commission drives. A drive can be essentially commissioned without having to use a printed parameter list – as the parameters are displayed in plain text, and explanatory help texts and the parameter filtering function are provided.

Application wizards interactively guide you when commissioning important applications such as conveyor technology, pumps, fans and compressors. There is a basic commissioning wizard for general commissioning.

Up to two process values can be graphically visualized and up to four process values can be numerically visualized on the status screen/display. Process values can also be displayed in technological units.

The IOP-2 supports standard commissioning of identical drives. For this purpose, a parameter list can be copied from an inverter into the IOP-2 and downloaded into other drive units of the same type as required.

The IOP-2 can be installed in control cabinet doors using the optionally available door mounting kit.

Updating the IOP-2

The IOP-2 can be updated and expanded using the integrated USB interface.

Data to support future drive systems can be transferred from the PC to the IOP-2. Further, the USB interface allows user languages and wizards that will become available in the future to be subsequently downloaded and the firmware to be updated for the IOP-2¹⁾.

The IOP-2 is supplied with power via the USB interface during an update.

IOP-2 Handheld



IOP-2 Handheld

A handheld version of the IOP-2 can be ordered for mobile use. In addition to the IOP-2, it includes a housing with rechargeable batteries, a charging unit, an RS232 connecting cable, and a USB cable. The charging unit is supplied with connector adapters for Europe, the US and UK. When the batteries are fully charged, the operating time is up to 10 hours.

To connect the IOP-2 Handheld to SINAMICS G110D, SINAMICS G120D, SINAMICS G110M and SIMATIC ET 200pro FC-2, the RS232 connecting cable with optical interface is required in addition.

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¹⁾ Information on updates for the IOP-2 is available at <https://support.industry.siemens.com/cs/document/67273266>

Selection and ordering data

| Description | Article No. |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <p>IOP-2 Intelligent Operator Panel For use with SINAMICS G120 SINAMICS G120C SINAMICS G120P SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2</p> <p>Operating languages: English, German, French, Italian, Spanish, Portuguese, Dutch, Swedish, Finnish, Russian, Czech, Polish, Turkish, Chinese Simplified</p> | 6SL3255-0AA00-4JA2 |
| <p>IOP-2 Handheld For use with SINAMICS G120 SINAMICS G120C SINAMICS G120P SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2</p> <p>Included in the scope of delivery:</p> <ul style="list-style-type: none"> • IOP-2 • Handheld housing • Rechargeable batteries (4 x AA) • Charging unit (international) • RS232 connecting cable ¹⁾ 3 m (9.84 ft) long, can be used in combination with SINAMICS G120 SINAMICS G120C SINAMICS G120P • USB cable 1 m (3.28 ft) long | 6SL3255-0AA00-4HA1 |
| Accessories | |
| <p>Door mounting kit For mounting an operator panel in control cabinet doors with sheet steel thicknesses of 1 ... 3 mm (0.04 in ... 0.12 in) Degree of protection IP55</p> <p>Included in the scope of delivery:</p> <ul style="list-style-type: none"> • Seal • Mounting material • Connecting cable 5 m (16.4 ft) long, also supplies voltage to the IOP-2 directly via the inverter | 6SL3256-0AP00-0JA0 |
| <p>RS232 connecting cable 2.5 m (8.20 ft) long, with optical interface for connecting the IOP-2 Handheld to SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2</p> | 3RK1922-2BP00 |

Benefits

- New device design
 - Intuitive user interface – membrane keyboard with central sensor control field
 - High-contrast color display with a range of display options
 - IOP-2 device design open for future functional expansions (e.g. device functions, wizards, languages)
 - Easily upgradable to new functional status via USB interface
- Commissioning
 - Simple commissioning via wizards
 - The "Fieldbus Interface Settings" wizard is used for easy configuration of the Ethernet interface
 - Fast standard commissioning of inverters thanks to cloning function
 - For quicker access, the parameter block names can be directly entered respectively changed on the IOP-2 using the virtual keyboard.
 - Simple local commissioning on-site using the handheld version
- Operator control and monitoring
 - Simple, individual local drive control (start/stop, setpoint value specification, change in direction of rotation)
 - Application-specific scenarios such as operator concepts with additional external operating elements can be implemented easily
 - Simple cloning of specific settings of the IOP-2 user interface, such as status screen, language settings, lighting duration, date/time settings, parameter backup mode and "My Parameters" – settings made once can such be easily transferred to many further IOP-2 Intelligent Operator Panels
- Diagnostics
 - Rapid diagnostics thanks to on-site plain text display
 - Integrated plain text help function for local display and resolution of fault messages
- Support function
 - Used to determine the drive data for the Power Module, Control Unit and IOP-2 (article number, serial number, firmware version, error statuses) and makes this available as a two-dimensional code (data matrix/QR code)
 - Allows easy contact with Customer Support via a data matrix/QR code generated on the IOP-2
 - Quick access via mobile devices (e.g. smartphones, tablets) to product information, documentation, FAQs, contact persons via a two-dimensional code generated on the IOP-2 (data matrix/QR code)
 - Scanning and evaluating of the two-dimensional data matrix code using the Industry Online Support app (<https://support.industry.siemens.com/cs/ww/en/sc/2067>), see also: <https://support.industry.siemens.com/cs/document/109748340>

¹⁾ For use in conjunction with SINAMICS G110D, SINAMICS G120D, SINAMICS G110M and SIMATIC ET 200pro FC-2, the RS232 connecting cable with optical interface is required (Article No.: **3RK1922-2BP00**). The cable must be ordered separately.

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Supplementary system components > IOP-2 Intelligent Operator Panel

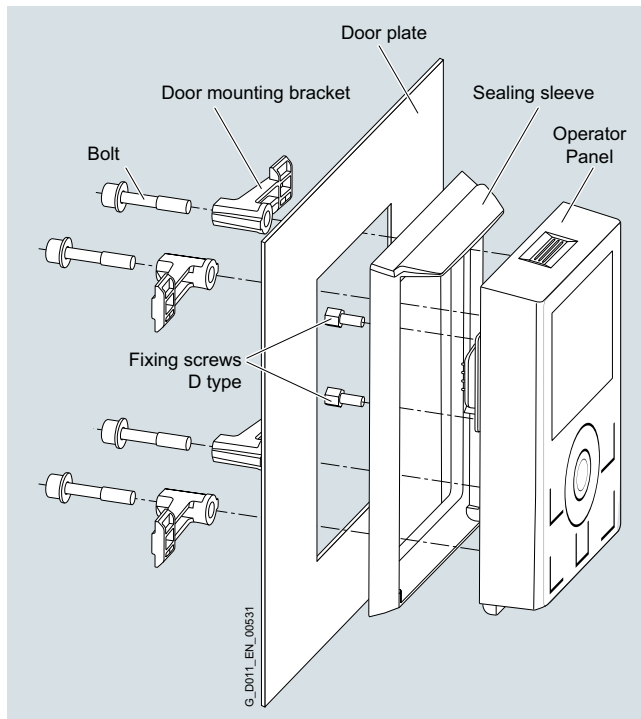
Integration

Using the IOP-2 with the inverters

| | <ul style="list-style-type: none"> SINAMICS G120 with CU230P-2, CU240E-2 or CU250S-2 SINAMICS G120C SINAMICS G120P with CU230P-2 | <ul style="list-style-type: none"> SINAMICS G110D SINAMICS G120D SINAMICS G110M SIMATIC ET 200pro FC-2 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Plugging the IOP-2 onto the inverter (Voltage supply via inverter) | ✓ | – |
| Door mounting of the IOP-2 with the door mounting kit (Voltage supply via inverter. For this purpose, the IOP-2 must be connected up by means of the connecting cable supplied with the door mounting kit.) | ✓ | – |
| Mobile use of the IOP-2 Handheld (supplied from rechargeable batteries) | ✓ | ✓ (RS232 connecting cable with optical interface required, article number 3RK1922-2BP00) |

Door mounting

Using the optionally available door mounting kit, an operator panel can be simply mounted in a control cabinet door with just a few manual operations. In the case of door mounting, the IOP-2 Operator Panel achieves degree of protection IP55/UL Type 12 enclosure.



Door mounting kit with plugged-on IOP-2

Technical specifications

| | IOP-2 6SL3255-0AA00-4JA2 | IOP-2 Handheld 6SL3255-0AA00-4HA1 | | |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------|
| Display | High-contrast color display, a variety of display options | | | |
| • Resolution | 320 × 240 pixels | | | |
| Operator panel | Membrane keyboard with central sensor control field | | | |
| Operating languages | English, German, French, Italian, Spanish, Portuguese, Dutch, Swedish, Finnish, Russian, Czech, Polish, Turkish, Chinese Simplified | | | |
| Ambient temperature | <ul style="list-style-type: none"> During transport and storage: -40 ... +70 °C (-40 ... +158 °F) During operation: <table border="0"> <tr> <td>For direct mounting on the inverter: 0 ... 50 °C (32 ... 122 °F)</td> <td>For installation with door mounting kit: 0 ... 55 °C (32 ... 131 °F)</td> </tr> </table> | | For direct mounting on the inverter: 0 ... 50 °C (32 ... 122 °F) | For installation with door mounting kit: 0 ... 55 °C (32 ... 131 °F) |
| For direct mounting on the inverter: 0 ... 50 °C (32 ... 122 °F) | For installation with door mounting kit: 0 ... 55 °C (32 ... 131 °F) | | | |
| Humidity | Relative humidity < 95 %, non-condensing | | | |
| Degree of protection | For direct mounting on the inverter: IP20 For installation with door mounting kit: IP55, UL Type 12 enclosure | IP20 | | |
| Dimensions (H × W × D) | 106.86 × 70 × 19.65 mm (4.21 × 2.76 × 0.77 in) | 195.04 × 70 × 37.58 mm (7.68 × 2.76 × 1.48 in) | | |
| Weight, approx. | 0.134 kg (0.3 lb) | 0.724 kg (1.6 lb) | | |
| Compliance with standards | CE, RCM, cULus, EAC, KC-REM-S49-SINAMICS | | | |

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Overview



BOP-2 Basic Operator Panel

The BOP-2 Basic Operator Panel can be used to commission drives, monitor drives in operation and input individual parameter settings.

Commissioning of standard drives is easy with the menu-prompted dialog on a 2-line display. Simultaneous display of the parameter and parameter value, as well as parameter filtering, means that basic commissioning of a drive can be performed easily and, in most cases, without a printed parameter list.

The drives are easily controlled manually using directly assigned navigation buttons. The BOP-2 has a dedicated switchover button to switch from automatic to manual mode.

Diagnostics can easily be performed on the connected inverter by following the menus.

Up to two process values can be numerically visualized simultaneously.

BOP-2 supports standard commissioning of identical drives. For this purpose, a parameter list can be copied from an inverter into the BOP-2 and when required, downloaded into other drive units of the same type.

The operating temperature of the BOP-2 is 0 °C ... 50 °C (32 °F ... 122 °F).

Selection and ordering data

| Description | Article No. |
|-----------------------------------|---------------------------|
| BOP-2 Basic Operator Panel | 6SL3255-0AA00-4CA1 |

Accessories

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <p>Door mounting kit For mounting an operator panel in control cabinet doors with sheet steel thicknesses of 1 ... 3 mm (0.04 in ... 0.12 in) Degree of protection IP55</p> <p>Included in the scope of delivery:</p> <ul style="list-style-type: none"> • Seal • Mounting material • Connecting cable (5 m/16.4 ft long, also supplies voltage to the operator panel directly via the inverter) | 6SL3256-0AP00-0JA0 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|

Benefits

- Shorten commissioning times – Easy commissioning of standard drives using basic commissioning wizards (setup)
- Minimize standstill times – Fast detection and rectification of faults (Diagnostics)
- Greater transparency in the process – The status display of the BOP-2 makes process variable monitoring easy (Monitoring)
- Direct mounting on the inverter (see also IOP-2)
- User-friendly user interface:
 - Easy navigation using clear menu structure and clearly assigned control keys
 - Two-line display

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Supplementary system components > Memory cards

Overview



SINAMICS SD memory card

The parameter settings for an inverter can be stored on the SINAMICS SD memory card. When service is required, e.g. after the inverter has been replaced and the data have been downloaded from the memory card, the drive system is immediately ready for use again.

- Parameter settings can be written from the memory card to the inverter or saved from the inverter to the memory card.
- Up to 100 parameter sets can be stored.
- The memory card supports standard commissioning without the use of an operator panel such as the IOP-2, BOP-2 or the STARTER and SINAMICS Startdrive commissioning tools.
- If firmware is stored on the memory card and a frequency inverter is installed, the firmware can be upgraded/downgraded during inverter startup ¹⁾.

Note:

The memory card is not required for operation and does not have to remain inserted.

Selection and ordering data

| Description | Article No. |
|-----------------------------------------------------------------------------------|-------------------------------|
| SINAMICS SD card 512 MB | 6SL3054-4AG00-2AA0 |
| <i>Optional firmware memory cards</i> | |
| SINAMICS SD card 512 MB + firmware V4.7 SP10 (Multicard V4.7 SP10) | NEW 6SL3054-7TF00-2BA0 |

For an overview and more information on all available firmware versions, see

<https://support.industry.siemens.com/cs/document/67364620>

Notes:

SINAMICS G120C compact inverters with frame size FSAA can be operated as of firmware V4.7 SP3.

SINAMICS G120C compact inverters with frame sizes FSD to FSF can be operated as of firmware V4.7 SP6.

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¹⁾ You can find more information about firmware upgrades/downgrades on the Internet at <https://support.industry.siemens.com/cs/document/67364620>

Overview



SINAMICS G120 Smart Access

It is also easy and convenient to commission and operate the SINAMICS G120, SINAMICS G120C and SINAMICS G120P inverters of firmware V4.7 SP6 and higher using the web server module SINAMICS G120 Smart Access and a connected smartphone, tablet or laptop.

Benefits

- Wireless commissioning, operation and diagnostics via mobile device or laptop thanks to the optional SINAMICS G120 Smart Access
- Easy access to the inverter in difficult-to-access areas
- Intuitive user interface and commissioning wizard
- Free choice of terminal devices as the web server works with all common web browsers, such as iOS, Android, Windows, Linux and Mac OS

Function

- Commissioning using commissioning wizard
- Setting and saving parameters
- Testing motor in JOG mode
- Monitoring of inverter data
- Quick diagnostics
- Saving the settings and restoring to factory settings

Integration



SINAMICS G120C, FSAA, SINAMICS G120 Smart Access

The optional SINAMICS G120 Smart Access is simply plugged onto the inverter and is available for the following inverters of firmware V4.7 SP6 and higher.

- SINAMICS G120C
- SINAMICS G120 together with the CU230P-2 and CU240E-2 Control Units (without fail-safe versions)
- SINAMICS G120P together with the CU230P-2 Control Units
[More information can be found in Catalog D 35.](#)

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Supplementary system components > SINAMICS G120 Smart Access

Selection and ordering data

| Description | Article No. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| SINAMICS G120 Smart Access NEW For wireless commissioning, operation and diagnostics of the following inverters using a smartphone, tablet, or laptop <ul style="list-style-type: none">• SINAMICS G120C• SINAMICS G120 together with the CU230P-2 and CU240E-2 Control Units (without fail-safe versions)• SINAMICS G120P together with the CU230P-2 Control Units | 6SL3255-0AA00-5AA0 |

Technical specifications

| | SINAMICS G120 Smart Access 6SL3255-0AA00-5AA0 |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Operating system | iOS, Android, Windows, Linux, Mac OS |
| Languages | Support of six languages: English, French, German, Italian, Spanish, Chinese |
| Ambient temperature <ul style="list-style-type: none">• During storage and transport• During operation | -40 ... +70 °C (-40 ... +158 °F) 0 ... 50 °C (32 ... 122 °F) if the Smart Access is plugged directly into the inverter |
| Humidity | < 95 %, non-condensing |
| Degree of protection | Depending on the degree of protection of the inverter, max. IP55/UL Type 12 enclosure |
| Dimensions <ul style="list-style-type: none">• Width• Height• Depth | 70 mm (2.76 in) 108.9 mm (4.29 in) 17.3 mm (0.68 in) |
| Weight, approx. | 0.08 kg (0.18 lb) |
| Compliance with standards | CE, FCC, SRRC, WPC, ANATEL, BTK |

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Overview



PC inverter connection kit 2

For controlling and commissioning an inverter directly from a PC if the STARTER¹⁾ commissioning tool or SINAMICS Startdrive has been installed on the PC. With this, the inverter can be

- parameterized (commissioning, optimization),
- monitored (diagnostics)
- controlled (master control via the STARTER or SINAMICS Startdrive commissioning tool for test purposes)

A USB cable (3 m/9.84 ft) is included in the scope of delivery.

Selection and ordering data

| Description | Article No. |
|-------------------------------------|---------------------------|
| PC inverter connection kit 2 | 6SL3255-0AA00-2CA0 |
| USB cable (3 m/9.84 ft long) for | |
| • SINAMICS G120C | |
| • SINAMICS G120 Control Units | |
| - CU230P-2 | |
| - CU240E-2 | |
| - CU250S-2 | |
| • SINAMICS G110M Control Units | |
| - CU240M | |
| • SINAMICS G120D Control Units | |
| - CU240D-2 | |
| - CU250D-2 | |

Overview

A shield connection kit is supplied as standard with frame sizes FSAA to FSC. A set of shield plates is included in the scope of delivery for the motor and signal cables corresponding to the frame size for the frame sizes FSD to FSF. For the electromagnetically compatible connection of an optionally connectable braking resistor, the corresponding shield connection kit is to be ordered for frame sizes FSD to FSF.

Selection and ordering data

| Description | Article No. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Shield connection kit for SINAMICS G120C | |
| • Frame sizes FSAA to FSC | Supplied with the inverter, available as a spare part |
| • Frame sizes FSD to FSF | |
| A set of shield plates is included in the scope of delivery for the motor and signal cables corresponding to the frame size. For the electromagnetically compatible connection of an optionally connectable braking resistor, the corresponding shield connection kit is to be ordered. | |
| - Frame size FSD | 6SL3262-1AD01-0DA0 |
| - Frame size FSE | 6SL3262-1AE01-0DA0 |
| - Frame size FSF | 6SL3262-1AF01-0DA0 |

¹⁾ The STARTER commissioning tool is available on the Internet at www.siemens.com/starter

SINAMICS G120C compact inverters

0.55 kW to 132 kW (0.75 hp to 150 hp)

Spare parts

Overview

The following spare parts are available for SINAMICS G120C for service and maintenance work.

SINAMICS G120C shield connection kits

A shield connection kit is supplied as standard with frame sizes FSAA to FSC.

A set of shield plates is included in the scope of delivery for the motor and signal cables corresponding to the frame size for the frame sizes FSD to FSF. For the electromagnetically compatible connection of an optionally connectable braking resistor, the corresponding shield connection kit is to be ordered for frame sizes FSD to FSF.

SINAMICS G120C spare parts kit

This kit comprises 4 I/O terminals, 1 RS485 terminal, 2 sets of Control Unit doors (1 x PN and 1 x other communication versions) and 1 blanking cover.

SINAMICS terminal cover kit

The terminal cover kit includes a replacement cover for the connecting terminals.

Terminal cover kits, which are suitable for frame sizes FSD to FSF, are available.

SINAMICS G120C connectors

A set of connectors for the line feeder cable, braking resistor and motor cable can be ordered corresponding to the frame size of the SINAMICS G120C compact inverter for the frame sizes FSAA to FSC.

SINAMICS G120C roof-mounted fan

A roof-mounted fan (at the top of the device) comprising a pre-assembled unit with holder and fan can be ordered corresponding to the frame size of the SINAMICS G120C compact inverter.



SINAMICS G120C frame size FSB, with integrated roof-mounted fan

SINAMICS G120C fan unit

A replacement fan (at the rear of the device; heat sink) comprising a pre-assembled unit with holder and fan can be ordered corresponding to the frame size of the SINAMICS G120C compact inverter.



SINAMICS G120C frame size FSB, with fan unit (rear view of rotated inverter)

Selection and ordering data

| Description | Article No. |
|---------------------------------------------|--------------------|
| SINAMICS G120C shield connection kit | |
| • Frame size FSAA | 6SL3266-1ER00-0KA0 |
| • Frame size FSA | 6SL3266-1EA00-0KA0 |
| • Frame size FSB | 6SL3266-1EB00-0KA0 |
| • Frame size FSC | 6SL3266-1EC00-0KA0 |
| • Frame size FSD | 6SL3262-1AD01-0DA0 |
| • Frame size FSE | 6SL3262-1AE01-0DA0 |
| • Frame size FSF | 6SL3262-1AF01-0DA0 |
| SINAMICS G120C spare parts kit | |
| • Frame sizes FSAA to FSC | 6SL3200-0SK41-0AA0 |
| • Frame sizes FSD to FSF | 6SL3200-0SK08-0AA0 |
| SINAMICS terminal cover kit | |
| • Frame size FSD | 6SL3200-0SM13-0AA0 |
| • Frame size FSE | 6SL3200-0SM14-0AA0 |
| • Frame size FSF | 6SL3200-0SM15-0AA0 |
| SINAMICS G120C connectors | |
| • Frame sizes FSAA and FSA | 6SL3200-0ST05-0AA0 |
| • Frame size FSB | 6SL3200-0ST06-0AA0 |
| • Frame size FSC | 6SL3200-0ST07-0AA0 |
| SINAMICS G120C roof-mounted fan | |
| • Frame size FSAA | 6SL3200-0SF38-0AA0 |
| • Frame size FSA | 6SL3200-0SF40-0AA0 |
| • Frame size FSB | 6SL3200-0SF41-0AA0 |
| • Frame size FSC | 6SL3200-0SF42-0AA0 |
| SINAMICS G120C fan unit | |
| • Frame size FSA | 6SL3200-0SF12-0AA0 |
| • Frame size FSB | 6SL3200-0SF13-0AA0 |
| • Frame size FSC | 6SL3200-0SF14-0AA0 |
| • Frame size FSD | 6SL3200-0SF15-0AA0 |
| • Frame size FSE | 6SL3200-0SF16-0AA0 |
| • Frame size FSF | 6SL3200-0SF17-0AA0 |



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